

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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## Wanted

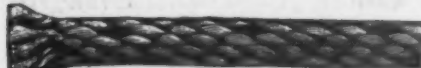
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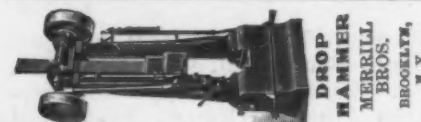
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Adv. on Page 16

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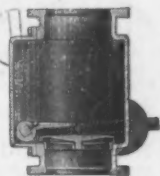
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# THE IRON AGE

New York, Thursday, December 27, 1906.

## The Clark Freight Unloader.

It has always been a perplexing problem to handle mixed freight economically and rapidly from and to the holds of deep draft oceangoing vessels. Of the many different methods that have been followed by various shippers practically all have involved an immense amount of hand labor and the use of derricks. These processes are slow and wasteful, as much time is spent in the unavoidable waiting for the hoist hooks to return.

About a year ago patents were issued to Franklin B. Clark of Washington, D. C., on a continuous machine for handling freight which seems to offer the most satis-

being continuously taken away by an endless chain and the empty hooks return simultaneously. There is always a hook ready to receive the next load, and its actual traveling speed has little to do with the quickness or efficiency of the machine.

The Clark machine is to general freight what the grain elevator is to grain, a continuous, quick and cheap method of moving it. It is not confined merely to the loading and unloading of ships, but is just as applicable to transporting goods in warehouses, along docks or from docks to different floors of a warehouse, &c. It will do the work in from one-quarter to one-third of the time required by the present methods, both because the interval between drafts is shorter and the time spent in

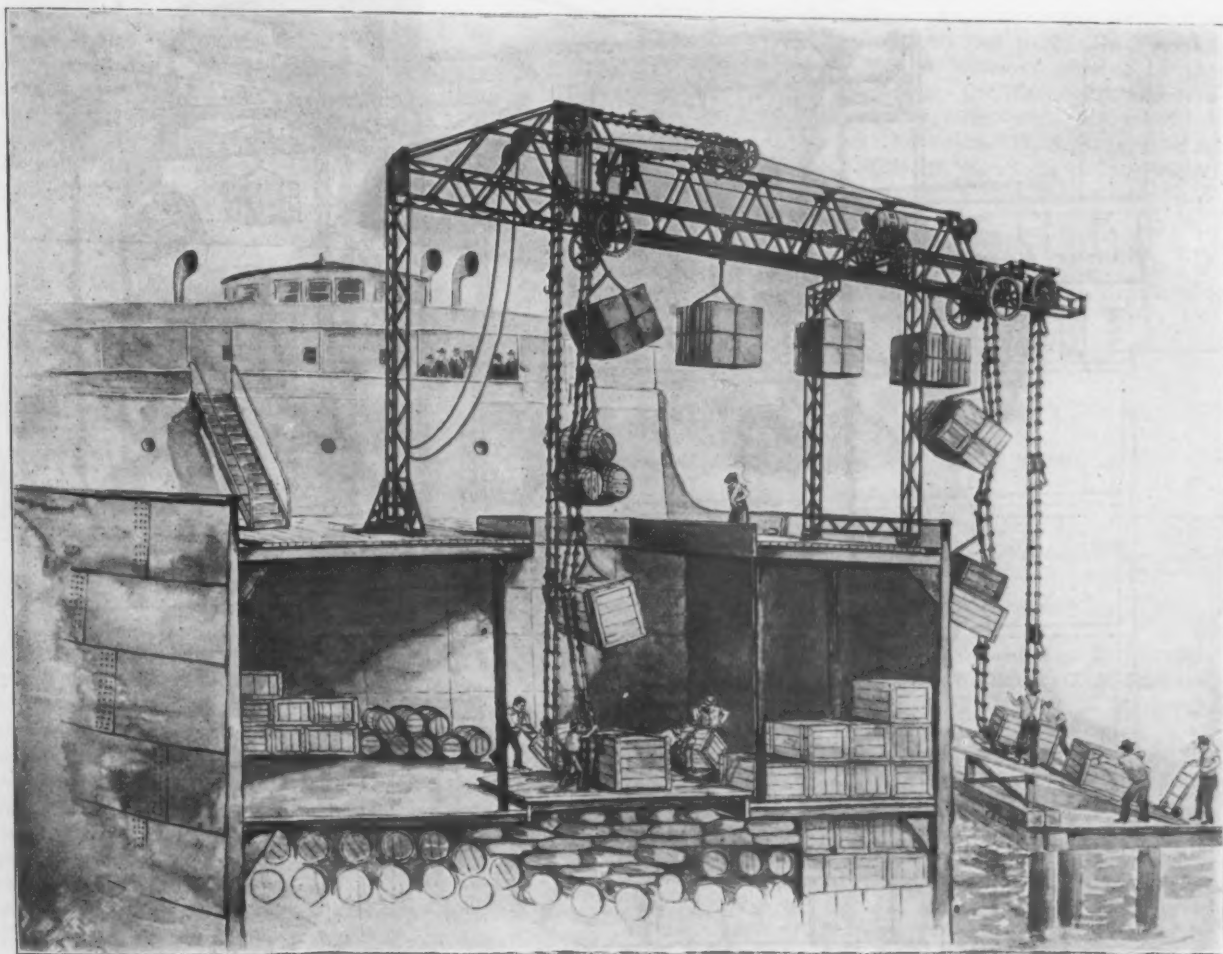


Fig. 1.—A Portable Clark Freight Unloading Machine as Mounted on the Deck of a Vessel.

factory solution of the problem yet proposed. The Clark Conveyor Company, 114 Liberty street, New York City, is licensed under these patents and is engaged in the manufacture of the Clark machines. The company's engineers have made numerous improvements since the first patents were taken out, and other patents will soon be issued.

The machine, it is claimed, will save the enormous time and labor costs as required by the systems now in use. With the derrick system a large force of men is required, some in the hold, a few on the deck and others on the dock. At least half of these men are idle all of the time, waiting for the derrick hooks to return, and the speed of loading or unloading can only be accelerated by increasing the speed with which the drafts are carried from the hold to the dock, or *vice versa*. With the use of the Clark machine the speed of hoisting and conveying is of much less importance, as the drafts are

the idle return trips required with the present hoist systems is saved, so that it seems to offer a great reduction in the cost of handling freight.

In unloading ships the draft will be attached to the hooks in the hold of the ship and the chain will carry it up out of the hatch, over the deck and down to the dock. It will there be taken off on the landing platform and taken care of by the dock gang. The operation from the dock to the ship is simply the reverse, and handling in other places is similarly done. The men are continuously employed, as there is no waiting. This item alone will be a great saving. The fact that the men are working all the time will enable a man to unload so much more in a given time that the time taken to unload the whole ship will be greatly reduced. As a consequence the time that the ship is docked is shortened and it will be enabled to make many more trips during its life, with less idle time for its crew, so that here again will be a

great saving. Still another advantage is that a greater amount of freight can be handled at one pier, reducing the number of piers required to handle the same amount of freight.

The machine as made for ships by the Clark Conveyor Company is illustrated in Fig. 1. It consists of a main bridge mounted on uprights, as shown, these parts being made of light structural steel, latticed to give ample strength. The chain which forms the continuous conveyor carries the loads suspended on hooks underneath the bridge. At each end it passes over sprockets and hangs free. By means of an adjuster on the return side the slack caused by the rise of the tide or by the lightening of the ship is taken care of, and the ends are kept at the proper distance from the dock or the ship's bottom. By an ingenious mechanical device the one adjuster takes care of both ends of the chain.

The sprockets and through them the chains are driven

Powerful solenoid brakes will stop the machinery almost instantaneously.

Machines for numerous uses are being projected by the company, and their sphere of usefulness promises to be almost unlimited. Fig. 2 shows a somewhat different application of the same principle, this being a machine permanently located on the dock instead of temporarily erected on the deck of the ship. It is arranged to travel the length of the dock, the bridge being trunnioned between its supporting columns so that it may be swung to a vertical position to allow passing to any doorway in the pier shed. The same motor that controls the tilting of the bridge may be used for travelling the machine. The chain driving system is in general similar to that employed on the deck machine. With the many different modifications that are possible machines may be adapted to almost any specific purpose. The actual conditions applying on various piers would require a more or less

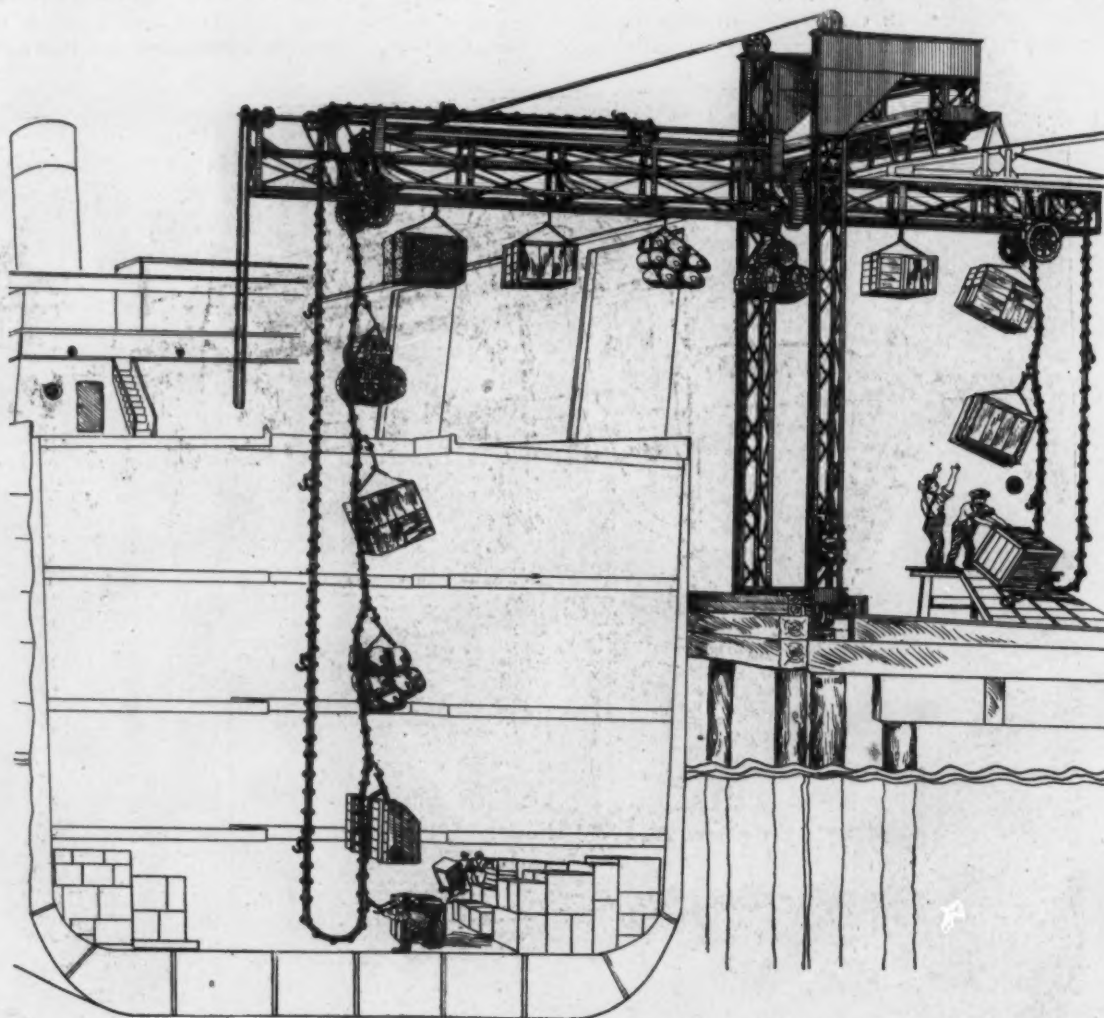


Fig. 2.—A Clark Freight Unloader Permanently Mounted on the Dock.

by an electric series motor, the power being applied by shafting and worm gears. The worm gears lock the chain and prevent any accidents due to a cutting off of the power, which might otherwise permit the loads to run backward and do possible damage.

The main bridge is supported at the ship end by a light column and at the dock end by a cross beam, which rests on two light latticed columns. These columns are on rollers, which distribute the load over the deck and facilitate locating the machine to the hatch. The machine is kept from sidewise movement, when once in position, by stays which fasten the columns firmly to the ship. All joints are riveted, except where it is desired to take the machine apart. At such places bolts are used and the machine is made to be assembled or taken down in a very short time. On an average one-half hour will be sufficient, as the parts are easily handled and suitably connected. All parts are made amply strong to stand rough usage and guard against accident to the attendants.

special design for each case where the dock machine is to be employed, but a deck machine of the kind shown in Fig. 1 would answer for any vessel of approximately the same width of beam. Without a doubt the costs and time of freight handling may be very materially reduced by adopting one or another of the possible applications of the Clark system.

A pamphlet entitled "American Trade with the Levant and Its Possibilities," has been issued by Aris. Tsakonas, mechanical engineer, 5212 Jefferson street, Philadelphia, which is of practical interest to American manufacturers. Mr. Tsakonas, writing from long experience, points out wrong methods pursued by exporters in their commercial relations with the Levant, and especially with Greece. The pamphlet is published for free distribution, and manufacturers can secure copies by addressing the author.



## A Notable Forced Draft Installation.

The forced draft installation now being made in the power plant at the new works of the Bethlehem Steel Company is probably one of the most unique ever applied to boilers aggregating such a horsepower—nearly 16,000. It is believed to be the largest use of forced draft in a single power house ever attempted. A peculiar feature is that no economizers will be used in connection with the boilers to utilize the waste heat in the flue gases for tempering the boiler feed water.

The boiler installation consists of 32 500-hp. Stirling boilers, each having 107 sq. ft. of grate surface. The boilers are placed in batteries of 1000 hp. in a double row, with the firing fronts facing each other. A steam pressure of 150 lb. will be maintained continuously, day and night, six days in the week. The fuel used will be anthracite rice coal.

Due to the serious inconvenience which would arise if the artificial draft should fail—namely, shutting down the rolling mill—it was desired to have the fans so arranged that should any one become disabled the others would be able to carry the load at once. To this end, and also to provide low friction losses, the ducts are arranged as shown in the illustration and made of large size. Three fans serve each row of eight 1000-hp. batteries, and each blower is provided with a counter-weighted sliding damper at its discharge into the common duct. This permits a careful regulation of the

steel and are riveted to the braces and side sheets, the latter being of No. 10 steel. When completed the wheels were given a careful running test to insure perfect balancing.

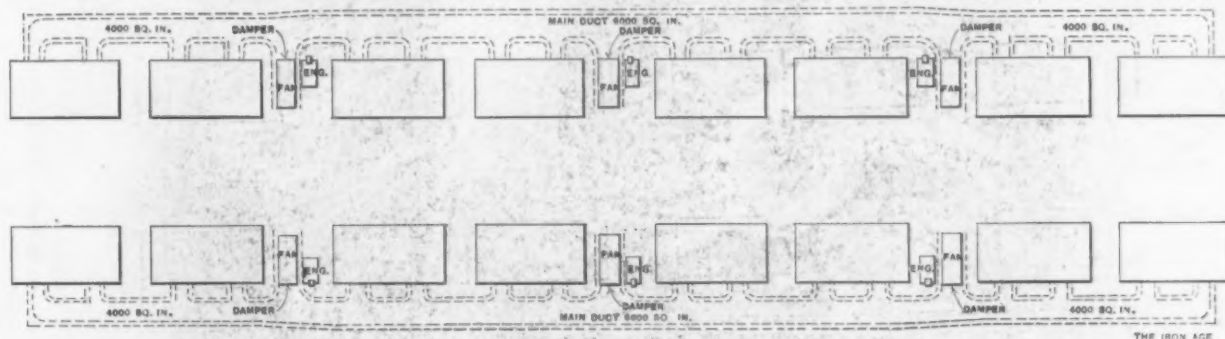
Air is delivered to the fire pits through Buffalo diffusing dampers measuring 15 x 34 in., and operated by rods passing through the boiler fronts in a convenient position.

Each fan is direct connected through a plain coupling to a Buffalo 10 x 20 in. horizontal side crank engine, the working parts of which are inclosed in a neat sheet steel casing, entirely protecting it from dust and injury. The exhaust from the fan engine is turned into the discharge opening of the fan.

The entire equipment, including fans and engines, will weigh between 45 and 50 tons. The installation will be made by engineers from the Buffalo Forge Company, Buffalo, N. Y., which furnished the machines.

### Rogers, Brown & Co.'s Anniversary.

The firm of Rogers, Brown & Co. celebrated its twenty-sixth anniversary at Cincinnati last week. On Tuesday the several partners held a business meeting in the offices in the Carew Building. On Wednesday luncheon was had at the Queen City Club, with the following participants: Members of the firm—W. A. Rogers, M. C. Armour, W. T. Shepard, D. B. Meacham, A. A. Fowler, E. L. Billingslea, J. K. Pollock; salesmen—G. R. Sulli-



The Layout of the Mechanical Draft Equipment for the Boiler Plant of the Bethlehem Steel Company.

amount of air being delivered by each fan, as well as assuring the independence of each blower.

As a rough estimate, allowing 5 lb. of coal per boiler horsepower per hour and assuming that the plant will be operated at the rated capacity, 16,000 hp., the hourly consumption of fuel will be 40 tons, and providing 5 cu. ft. of air per pound of coal per minute, the total requirement will be 400,000 cu. ft. of air per minute. The capacity required of each fan at normal discharge was therefore 66,600 cu. ft. per minute. To maintain a pressure of  $\frac{1}{2}$  ounce a 200-in. fan, with blast wheel 130 in. in diameter, would need to be run at a speed of

$$\frac{5171\sqrt{0.5} \times 12}{3.1416 \times 130} = 107 \text{ rev.}$$

If it was desired to maintain a pressure of  $\frac{3}{4}$  ounce, it would be necessary to run the fan at 132 rev. per min.

The fans are of the three-quarter housing type, set directly over the duct they are to discharge into. The longitudinal section of the portion of the duct directly beneath the fan, is shaped to properly continue the curve of the fan housing and form a discharge opening of the proper area and shape. All construction beneath the surface is in concrete. The housing side sheets are of No. 10 gauge patent leveled steel plates. Bracing of 4 x 5 in. angle iron is provided both horizontally and vertically for the side sheets. Around the base of the housing is riveted a 4 x 6 in. angle, which is drilled for foundation bolts.

The design of the blast wheel called for a diameter of 130 in. and width at the periphery of 92 in. The braces carrying the fan blades or wings are of heavy tee iron, cast into large diameter cast iron hubs, firmly keyed to the shaft, which is of hammered steel and is  $5\frac{1}{4}$  in. in diameter. The wings of the blast wheel are of sheet

van, S. W. Hubbard, Harwood Wilson, Jas. R. Darragh, H. W. Fernald, J. C. Mears, F. W. Bauer, C. A. Stillman, F. I. Foote, F. C. Wright, H. E. Frazier, E. McBirney, H. E. Turner, W. D. Patton, Geo. W. Douglas, A. J. Wentworth, H. B. B. Yergason, R. D. Meacham, T. A. Wilson, Ralph W. Clark, Noah H. Swayne, 2d, F. F. Newcomb, Geo. Rea, E. A. Hummell, J. G. Hancock, William Sampson, A. O. Galloway, S. B. Lyman, F. W. Miller. The post prandial programme consisted of a speech of welcome by W. A. Rogers, with a response by Noah H. Swayne, 2d, and addresses on "The Art of Selling," by W. T. Shepard; "Is Everybody Happy?" by M. C. Armour; "Letter from a Furnaceman to His Salesmen," by H. B. B. Yergason; "Do You Believe in Furnaces?" by J. K. Pollock; "Coke Whys and Ways," by F. W. Miller; "Southern Conditions and Other Tales of Woe," by C. A. Stillman; "I Will Speak Even if I am from Chicago," by E. L. Billingslea; "Prosperity and Automobiles," by D. B. Beacham; "English and Scotch, Don't Cher Know," by A. A. Fowler.

The New York partner, A. A. Fowler, who recently returned from England, where he had been in the interest of the firm relative to iron that was being imported into this country, brought a trunk containing many novel and suggestive features in the way of gifts. For example, W. A. Rogers received a representation of one of the lake ore carriers, on which was inscribed his name, being an exact counterpart of the vessel plying the lake trade. On Wednesday evening the party was the guest of D. B. Meacham at his home, where the evening was pleasantly spent. Thursday was devoted to general discussion along business lines, with luncheon at the Business Men's Club. The Cincinnati local representatives will on Thursday give the 35 office employees a dinner at the Business Men's Club.



## The Bracket Arch Car Wheel.

The need of more elasticity in cast iron car wheels and greater strength at the flange than is obtainable in the double plate design now in general use influenced the Louisville Car Wheel & Railway Supply Company, Louisville, Ky., to bring out the so-called bracket arch wheel, herewith illustrated. It appears to provide the increased strength just where it is most needed, at the flange, and, it is claimed, without sacrificing the strength of the wheel. Comparative drop and thermal tests of the bracket arch wheel and the double plate wheel bear out this contention. The double arch also is believed to have increased the elasticity of the wheel. Some of these wheels have been in use under 110,000-lb. cars since November, 1904, and also under 7000-gal. engine tenders for almost as long a time and not a single failure has been reported from a broken or seamy flange. The wheel, two views of which are shown in Fig. 1, is covered by patents issued to D. P. Rennie and D. H. Cheney, secretary of the company.

It is a curious fact that as demands increased, cast iron wheels for heavy cars were strengthened in the

weight falling 12 ft. A 33-in. double plate 700-lb. M. C. B. standard wheel for a 100,000-lb. capacity car withstood 37 blows before cracking, and broke under the sixty-fifth blow. The chill in the throat was 7-16 in. deep and in the tread 11-16 in. A 33-in. single plate bracket arch 700-lb. wheel withstood 135 blows before cracking, and the crack then discovered did not extend into the plate. Three arms supporting the hub were cracked. The wheel after being struck 138 blows without breaking was broken under a drop of 1640 lb. weight. The chills in the throat and the tread were of the same depth as in the first wheel—i. e., 7-16 and 11-16 in., respectively. The test is quite remarkable from the fact that the cast iron wheel is supposed and does get its strength from the gradual reduction in the temperature, which is accomplished by the process of annealing.

The construction, as set forth in the patent specification, secures an increased strength at the rim and flange portion to enable the wheel better to resist thrust without increasing its weight or the cost of manufacture. A transverse section of one of these wheels, and also one of the double plate type, are shown in Fig. 2. To better in-

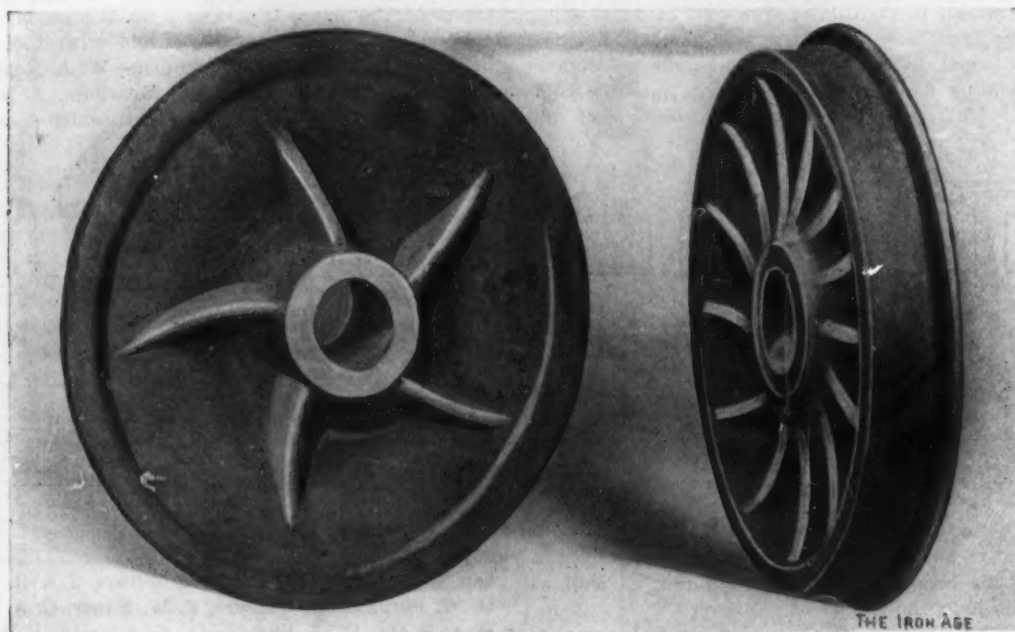


Fig. 1.—Two Views of the Bracket Arch Car Wheel Made by the Louisville Car Wheel & Railway Supply Company, Louisville, Ky.

tread, hub, plates and all other parts except the flanges, where over 96 per cent. of the dangerous defects in cast iron car wheels develop. The flanges of wheels under 40,000-lb. cars were as strong as those under 100,000-lb. cars, and the additional weight and friction on such flanges caused the crystals of the chill to heat and separate, forming so-called seams, which if not discovered in time break through the flange and tread, as indicated by the dotted line in Fig. 3.

It is the maker's opinion that it is practically impossible for the bracket arch wheel to break through the flange and tread, where the double plate wheel usually gives way. The bracket arch wheel is poured in the same manner as an ordinary car wheel, except that owing to the construction of the wheel it can be poured in about one-third less time than a double plate wheel of the same weight. That rapid pouring tends to make more perfect wheels, it is believed all makers admit.

To determine the strength of the bracket arch wheel, as compared with the M. C. B. design of the same weight, two wheels of exactly the same iron were poured at the same time and to avoid any difference that might be effected in annealing they were not annealed, but only allowed to cool off rapidly in the air. The results of the tests of these two wheels, made in the presence of an inspector of the Louisville & Nashville Railroad Company, follow:

Both wheels were subjected to the blows of a 140-lb.

dicat where the strength has been added Fig. 3 gives a superimposed detail of the head and flange of both wheels, the dotted lines showing where the bracket arch wheel differs. The dotted line through the rim adjacent to the flange indicates the point where fracture usually occurs in the double plate wheel, and it will be readily seen that no break can occur at this point in the new design.

As the requirements imposed on them became more exacting flanges might have been increased in width to increase their strength had it not been for the limit set by the construction of frogs and switches on railroads. The problem has been, therefore, to secure the desired strength at and adjacent to the flanges, but without unduly increasing the weight of the wheel and to maintain the lowest possible cost of manufacture, to which ends and for other reasons it is desirable to dispense with the use of ring cores in constructing the wheel. The solution has been the extending of the web or arch plate from the forward end of the hub in a reverse curve inward to meet the inside of the rim at a point opposite the flange. By this means a much larger weight of metal is concentrated adjacent to the flange than in the ordinary construction without any actual increase in the amount of metal in the wheel, while also increasing the depth of metal back of the flange.

Brackets on the inner side of the arch plate extending to the hub and on the outer side extending to the rim

still further strengthen the wheel. These are curved and set at such an angle as to reinforce a larger area of the arch plate circumferentially than if they were arranged radially. The inner brackets in connection with the outward curve of the arch plate at this point not only strengthen this part so as to better resist the thrusts of the axle when running around curves, but also prevent the fanning of sand and dust toward the oil boxes, which takes place where the brackets are arranged on the outside adjacent to the hubs. By recurving the arch plate inward near the rim and placing the brackets between the rim and the arch plate the wheel is better able to resist the lateral thrust when forced against the track rails.

The construction provides the necessary strength of the web of the wheel and reinforces the rim without the use of a double arch plate, which necessitates employing cores in the manufacture and which often results in de-

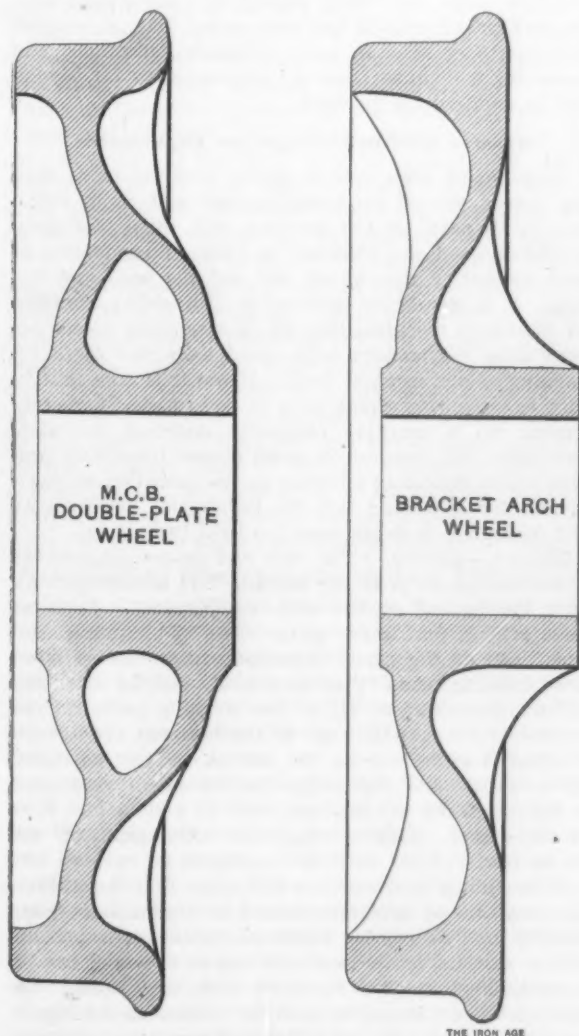


Fig. 2.—Sectional Views of the Double Plate and Bracket Arch Car Wheels Compared.

fects not evident until the wheel breaks. The hub adjacent to the journal is also strengthened so that the heating of the latter has less tendency to split the hub.

Internal Revenue Commissioner Yerkes at Washington comments on a criticism of the denatured alcohol law, on the ground that only regular distillers can engage in the manufacture of such alcohol, and that therefore the largest distillery interest may secure a practical monopoly. He says that while regular distilleries are the only ones recognized by law, there are over 1000 of these at which the daily capacity is less than 30 gal., and many of them were set up at an outlay of \$200. The Government pays for all supervision. A farmer or other person desiring to manufacture denatured alcohol must build his plant as described by the Government regulations, must give bond and establish a distillery warehouse. The restrictions in general are such as prevail in Germany.

### The Pennsylvania Railroad's Freight Movement.

The following interesting statement is made regarding the improvements in handling freight by the Pennsylvania Railroad:

Four years ago, instead of complaints of car shortage, the Pennsylvania Railroad was suffering from an extraordinary freight congestion. The enormous expenses which have been incurred since that time for improvement in yards, terminals and low grade lines, are now bearing fruit in the ability the company enjoys to move its present unprecedented freight tonnage with the utmost freedom.

The Pitcairn yard has made possible through classifications at Pittsburgh, and the Brilliant Cut-Off makes it possible for through cars to go around Pittsburgh and

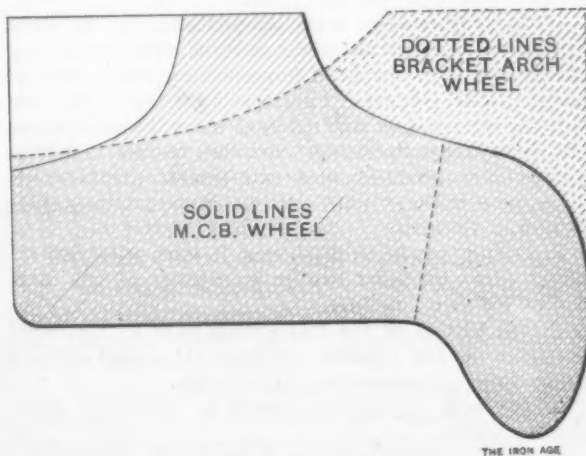


Fig. 3.—Superimposed Details Comparing the Sections Near the Rim.

not take up the terminal. The Hollidaysburg yard separates merchandise from mineral freight and places them in separate trains. The Enola yard makes it possible to keep Harrisburg clear. The completion of the low grade freight line from Glen Loch to Atglen relieves the main line of a large amount of heavy freight.

The enormous proportions of the movement now progressing may be seen from the figures as to cars passing Lewistown Junction. The movement there in October, 1902—at the high of the famous "block" of that year—was 170,558. In the month of October, 1906, with fairly normal conditions prevailing, 179,849 cars were moved past that point without difficulty or delay. It will be observed that this increase of cars moved means a very much greater proportionate gain in tons moved.

Not only is the number of cars and their capacity increased; not only is a larger number of cars in actual motion, but the daily distance traveled by each car has been materially increased. For September, 1905, the average was 25.10; for September, 1906, 25.66. For October, 1905, it was 25.057, and for October, 1906, it was 27.19. The total car mileage in September, 1906, was 106,218,556; in October it was 112,830,105.

As illustrating the method of dealing with smoke from manufacturing stacks in England, British exchanges record the prosecution of the Sheffield Forge & Rolling Mills Company, Limited, for allowing black smoke to issue from the chimneys at its works on 26 days, the emissions sometimes lasting 36 min. in an hour. For each of five days the firm was fined 10 shillings and costs, the other cases being dismissed. Burys & Co., steel manufacturers, were summoned for a similar offense. The manager stated that whatever the firm was fined the men responsible for the firing had to pay. The alternative was dismissal. The court agreed that that was one way to make the men exercise proper care. He ordered the nuisance abated, and fined the firm 8 shillings 6 pence costs.



## The Chatter of the Tool.\*

The following are the general conclusions arrived at on the subject of chatter of the tool:

Chatter caused by the nature of the work:

A. Chatter is the most obscure and delicate of all problems facing the machinist, and in the case of castings and forgings of miscellaneous shapes probably no rules or formulae can be devised which will accurately guide the machinist in taking the maximum cuts and speeds possible without producing chatter.

B. It is economical to use a steady rest in turning any piece of cylindrical work whose length is more than 12 times its diameter.

Chatter caused by the method of driving the work:

C. Too small lathe dogs or clamps or an imperfect bearing at the points at which the clamps are driven by face plate produce vibration.

Chatter caused by cutting tools:

D. To avoid chatter tools should have cutting edges with curved outlines and the radius of curvature of the cutting edge should be small in proportion as the work to be operated on is small. The reason for this is that the tendency of chatter is much greater when the chip is uniform in thickness throughout, and that tools with curved cutting edges produce chips which vary in thickness, while those with straight cutting edges produce chips uniform in thickness.

E. Chatter can be avoided, even in tools with straight cutting edges by using two or more tools at the same time in the same machine.

F. The bottom of the tool should have a true, solid bearing on the tool support, which should extend forward almost directly beneath the cutting edge.

G. The body of the tool should be greater in depth than its width.

Chatter connected with the design of the machine:

Chatter caused by modifications in the machine may be classified as follows:

H. It is sometimes caused by badly made or fitted gears.

J. Shafts may be too small in diameter or too great in length.

K. Loose fits in the bearings and slides may occasion chatter.

L. In order to absorb vibrations caused by high speeds machine parts should be massive far beyond the metal required for strength.

The effect of chatter upon the cutting speed of the tool:

M. Chatter of the tool necessitates cutting speeds from 10 to 15 per cent. slower than those taken without chatter, whether tools are run with or without water.

N. Higher cutting speed can be used with an intermittent cut than with a steady cut.

### Chatter as Produced or Modified by the Tool.

This paper is chiefly concerned with chatter as it is produced or modified by the cutting tool itself. Some of the other causes for chatter, however, may be briefly referred to. These may be divided into five groups:

A. The design of the machine.

B. The nature and proportions of the work being operated upon.

C. The care and adjustment of the parts of the machine.

D. The method of setting the work in the machine or of driving it.

E. The shape of the cutting tools, manner in which they are set in the machine and the speeds at which they are run.

Causes A and B are outside the control of the machinist. Elements C, D, and E are or should be to a large extent under the control of the management of the shop.

Referring now to cause A, "The design of the machine," the chief elements causing chatter in the design of a machine are:

a. Gears which are set out of proper adjustment or

the teeth of which are untrue. It should be noted that involute teeth will run smoothly whether their pitch diameters exactly coincide or not, whereas the epicycloidal teeth are almost sure to rattle unless their pitch lines are maintained in their exact proper relations one to the other.

b. Chatter is frequently caused through mounting the driving gears upon shafts which are either too small in diameter or too long. A large excess in the diameter of shafts beyond that required for strength is called for in order to avoid torsional deflection which produces chatter.

c. Lathe shafts and spindles must of course be very accurately and closely fitted in their bearings, and the caps adjusted so as to avoid all play.

d. For heavy work the lathe tailstocks should be fastened to the bedplates with bolts of very large diameter, and should be tightened down with long handled wrenches.

e. The lathe bed itself should be exceedingly massive, and should contain far more metal than is required for strength or even to resist ordinary deflections, and the moving tool supports should also be heavy far beyond what is required for strength.

### Massive Machines Needed for High Speeds.

Undoubtedly high cutting speeds tend far more than slow speeds toward producing minute and rapid vibrations in all parts of the machine, and these vibrations are best opposed and absorbed by having large masses of metal supporting the cutting tool and the head and tail stocks. It is largely for the purpose of avoiding vibration and chatter in machines that the high cutting speeds accompanying the modern high speed tools call for a re-designing of our machine tools. While it is true that in many cases a very great gain can be made by merely speeding up a machine originally designed for slow speed tools, this increase in speed almost invariably produces a corresponding increase in the vibration or chatter, and for absorbing this the lathes and machines of older design are in many cases too light throughout.

Cause C—namely, "The care and proper adjustment of the various parts of the machine" is almost entirely under the control of the shop management. It is of course evident that so far as the effect of chatter is concerned one of the most important causes can be eliminated from the shop by systematically looking after the careful adjustment of all of the working parts of the machine to see that the caps of the bearings are always so adjusted as to have no lost motion and yet not bind, and so that all gibs and wedges for taking up wear upon the various slides are kept adjusted to a snug fit. It is our experience, however, that the adjustment of the various parts of the machine should in no case be left to the machinist who runs his lathe, but that the adjustment and care of machines should be attended to systematically and at regular intervals by the management. In large shops a repair boss with one or two men can be profitably kept steadily occupied with this work. A tickler, however, should be used for reminding the repair boss each day of the adjustment of machines and the overhauling which should be attended to on that day.

### Cases of Chatter Controlled by the Machinist.

Cause D—namely, "The method of setting the work in the machine or of driving it," is in many cases capable of being directly under the control of the machinist.

a. One of the most frequent causes for chatter lies either in having too light or too springy clamps or lathe dogs fastened to the work for the purpose of driving it, or in having vibration at the point of contact between the lathe dog and the face plate of the lathe, or the driving bracket, which is clamped to it. In heavy work the clamps should be driven at two points on opposite sides of the face plate, and great care should be taken to insure a uniform bearing of the clamps at both of these driving points. Chatter through vibration at this point can frequently be stopped by inserting a piece of leather or thick lead between the clamps and the driving brackets on the face plate, which has the effect both of deadening the vibration and equalizing the pressure between the two outside diameters at which the clamp is driven by the face plate.

\* From "The Art of Cutting Metals," by Fred W. Taylor, Philadelphia.



b. A dead center badly adjusted so as to be either too tight or too loose on the center of the work, or any lost motion in the tailstock of the lathe is such an evident source of chatter that it need not be dwelt upon.

#### The Shape of the Cutting Tool Important.

Cause E—namely, "The shape of the cutting tools, the manner in which they are set in the machine and the speeds at which they are run." In a previous part of this statement we have attempted to explain the effect of a uniform thickness of chip in causing chatter, and have indicated that the proper remedy for this is to use a round nosed tool, which is always accompanied by a chip of uneven thickness. We have elsewhere also referred to the desirability of having the body of tools deeper than their width in order to insure strength as well as to diminish the downward deflection of the tool, which frequently results in chatter, particularly when the tools are set with a considerable overhang beyond their bearing in the tool post.

We have also called attention to the great desirability of designing tools with their bottom surfaces extending out almost directly beneath the cutting edge, and of truing up the bottom surface of the tools, so as to have a good bearing directly beneath the nose of the tool on the tool support. If sufficient care is taken in the smith shop and the smith is supplied with a proper surface plate the tools can be dressed so as to be sufficiently true on their bottom surfaces for all ordinary lathe work.

It has been the necessity for avoidance of chatter which has influenced us greatly in the adoption of round nosed tools as our standard. Tools with straight cutting edges, which remove chips uniform throughout in thickness can be run at very much higher cutting speeds than our standard round nosed tools, but owing to the danger of chatter from these tools their use is greatly limited. In fact almost restricted to those special cases in which chatter is least likely to occur. Attention should be called, however, to a method by which straight edge tools have been used successfully for many years upon work with which there was a very marked tendency to chatter.

#### How Straight Edge Tools Can Be Used Successfully.

While at the works of the Midvale Steel Company we superintended the design of a large lathe for rough turning gun tubes and long steel shafts, in which tools with long straight cutting edges were used without chatter, and yet at the high speeds corresponding to the thin chips which accompany this type of tool. This lathe was designed with saddle and tool posts of special construction, so that two independently adjustable tool supports were mounted on the front side of the lathe and one on the back side. In each of these slides a heavy straight edge tool was clamped. The three tools were then adjusted so that they all three removed layers of metal of about equal thickness from the forging, and although the tendency toward chatter, owing to the uniform thickness of the chip, was doubtless as great with these straight edge tools as with any others, the period of maximum or of minimum pressure for all three tools never corresponded or synchronized, so that when one tool was under maximum pressure one of the others was likely to be under minimum pressure. For this reason the total pressure of the chips on all three tools remained approximately uniform and chatter from this cause was avoided.

#### The Rule Regarding a Steady Rest.

Cause B—namely, "The nature and proportions of the work being operated upon."

In assigning daily tasks to each machinist with the help of our slide rules, the element which still continues to give the greatest trouble to the men who write out these instructions is deciding just how heavy a cut can be taken on the lighter and less rigid classes of work without causing chatter. This branch of the art of cutting metals has received less careful and scientific study than perhaps any other. While the element is one which must always remain more or less under the domain of "rule of thumb," since the causes which produce chatter, particularly in castings of irregular shapes, are so many and complicated as to render improbable their successful reduction to general laws or formulæ, undoubtedly much can be done toward attaining a more exact knowledge of

this subject, and experiments in this line present a most important field of investigation.

The following rule (belonging to the order of "rule of thumb"), which has been adopted by us after much careful and systematic observation extends over work both large and small, and covers a wide range:

It is economical to use a steady rest in turning any piece of metal whose length is more than 12 times its diameter.

When the length of a piece becomes greater than 12 times its diameter it is necessary to reduce the size of the cut to such an extent that more time will be lost through being obliged to use a light cut than is required to properly adjust a steady rest for supporting the piece.

There is one cause for chatter which would seem to be impossible to foresee and to guard against in advance—i. e., chatter which is produced by a combination of two or more of the several elements likely to cause chatter. If, for instance, the natural periods for vibration in the tool and in the work or in any of the parts of the lathe and the work happen to coincide or synchronize, then chatter is almost sure to follow, and the only remedy for this form of chatter seems to lie in a complete change of cutting conditions, a change, for instance, to a coarser feed, with an accompanying slower cutting speed, or vice versa. Unfortunately for economy higher speeds rather than slow speeds tend to produce this type of chatter, and the remedy therefore generally involves a slower cutting speed.

#### The Effect of Chatter Upon the Cutting Speed.

A tool which chatters to any great extent must be run at a rather slower cutting speed than a tool which runs free from chatter, as will be seen by the following carefully tried experiment:

A forging 14 ft. long, 4½ in. in diameter, made out of exceedingly hard steel, which was especially hammer hardened and uniform, was placed in the lathe and standard cuts 3-16-in. depth and 1-16-in. feed (with our standard round nosed tool ⅞-in.) were taken upon it in such a way that they first ran smoothly without chattering; other cuts were then taken in such a position on the forging that the tool chattered badly throughout its cut. This was accomplished by using a steady rest in one case, so as to prevent chatter, and in the other case running without the steady rest. All of the tools had been carefully standardized before starting the experiments, and proved uniform and capable of running at maximum cutting speeds. The forging had also been proved uniform, and its standard cutting speed had been shown to be between 15½ and 16 ft. per minute.

In the accompanying tables are given the details of the cutting speeds obtained with and without chatter. In one of these experiments the tool was run without water and in the other the tool was cooled through the use of a heavy stream of water. An examination of the results of this experiment indicates in general that chatter causes a reduction in cutting speed of from 10 to 15 per cent., whether tools are run without water or with a heavy stream of water to cool them.

#### Cutting With and Without Chatter.

Test No.	Mark on tool.	NO WATER ON THE TOOL.		Condition of tool at end of run.	Chattered or not.
		Cutting speed.	Duration of cut.		
		Ft. In.	Min.		
124 b	U <sub>9</sub>	15	20	Good.	No chatter.
125 b	U <sub>6</sub>	17 6	14½	Ruined.	No chatter.
126 b	U <sub>6</sub>	15	4½	Ruined.	Chattered badly.
127 b	U <sub>9</sub>	15	9½	Ruined.	Chattered badly.
		WATER ON THE TOOL.			
128 b	U <sub>10</sub>	19	5½	Ruined.	Chattered badly.
129 b	U <sub>10</sub>	19	20	Fair.	No chatter.

Experiment No. 125 b was made for the purpose of again showing conclusively that both the tool and the forging had been properly standardized. It will be noted that this tool, free from chatter, broke down in 14½ min. at a cutting speed of 17 ft. 6 in., whereas the tool just above it ran all right at 15 ft. for 20 min., showing that both the forging and tools had been properly standardized.

Accurate experiments on the chatter of the tool are difficult to make because the comparatively small diameter of work which is needed to insure chatter calls for

an extremely hard piece of metal (i. e., slow cutting speeds) in order to make the runs, which must last for 20 min., extend through a sufficiently short distance over the length of the forging, so that the tools shall not be in danger of chattering. It was for this reason that we were obliged to make the above forging out of extremely hard metal.

#### Higher Cutting Speed with an Intermittent Cut.

An intermittent cut, however, has a very different effect upon cutting speed from that produced by chatter. We have observed in a large number of cases that when a tool is used in cutting steel with a heavy stream of water on it (and this is the proper method of cutting steel of all qualities), a rather higher cutting speed can be used with an intermittent cut than with a steady one. The reason for this is that during that portion of the time when the tool is not cutting the water runs directly on those portions of the lip surface and cutting edge of the tool which do the work, and for this reason the tool is more effectively cooled with intermittent work than with steady work. As an example of intermittent work, the writer would cite:

a. Cutting the outside diameter of a steel gear wheel casting, in which case the tool is only one-half its time under cut.

b. Or turning small pieces of metal which are greatly eccentric.

c. Or, for example, all planer and shaper work which is not too long.

It would seem from a theoretical standpoint that a tool would be greatly damaged (and therefore a slow cutting speed would be called for) by the constant series of blows which its cutting edge receives through intermittent work. It will be remembered, however, that in planer work (and this class of intermittent work comes to the direct attention of every machinist) the tool is more frequently injured while dragging backward on the reverse stroke of the planer than it is while cutting, and it is very seldom that a tool is damaged as it starts to cut on its forward stroke. In all cases, however, where the tool deflects very greatly, when it starts its cut on intermittent work slower speeds are called for than would be required for steady work.

The above remarks on intermittent work do not of course apply to cast iron with a hard scale or the surface of which is gritty. It is evident that in all such cases owing to the abrasive action of the sand or scale on the tool intermittent work is much more severe upon the tool than a steady cut.

#### The Milwaukee Molders' Strike in the Courts.

"The right of the strike for any cause or for no cause is clearly and fully sustained. Even a conspiracy to strike, followed by legal damage, is not unlawful if formed to better labor conditions. Whether a threat to strike or bring about a strike when made by a number of persons in concert is lawful is an entirely different question." In these words Judge A. L. Sanborn of the United States District Court, in session at Madison, Wis., recently, expressed his opinion of the labor question in a decision against the strikers involved in the contempt proceedings brought by the Allis-Chalmers Company, Milwaukee, Wis., against striking iron molders. All of the defendants, with two exceptions, were held guilty by reason of having violated the injunction previously issued against them. While the decision holds that four iron molders' unions of Milwaukee, which were joint parties in the contempt proceedings, are guilty, as alleged, no punishment can be inflicted because they are voluntary associations and as such are not liable to punishment. The custom of placing a union button on the men doing picket duty was criticised, as it "operated to increase the efficiency and pressure of the coercion," and that they, "like the uniforms of the soldier, are emblems of a mysterious and powerful organization," which, he added, greatly increase the potency of the picket line. The buttons were adopted as a result of a suggestion made to the officers of the unions by Judge Quarles at the time of the issuance of the injunctive order, which the defendants

were convicted of having violated. The suggestions were made, Judge Quarles said at the time, in the hope that the button would serve to prevent future unions from becoming parties to street brawls and actions of a similar nature.

Discussing the means that may be adopted by either side in carrying on the strike, the decision states that neither side must be permitted maliciously to injure the other without cause or excuse. Judge Sanborn also held that indirect interference by a labor union with the employers' business, not amounting to coercion, by preventing him from getting workmen to carry on his shop, is not unlawful, as long as the combination is merely taking measures to secure its own legitimate advantages or economic advancement, although harm may incidentally result to the employers where persuasion reaches the stage of coercion. However, it was held that it becomes malicious injury if harm or damage results.

#### A Texas Electric Interurban Line.

A 65-mile electric road between Dallas and Sherman, Texas, is to be constructed by the Texas Traction Company, and contracts for the equipment have been let. An existing steam road between the two cities will be paralleled by the new line, which will be one of the longest electric roads in the State. Standard direct current apparatus will be used throughout, but in some respects the equipment presents interesting features. The new line being laid through flat and rolling country will require no grades exceeding 1 per cent. or curvatures exceeding 3 degrees. A private right of way has been purchased, so that high speed may be maintained and the run made in two and one-half hours. Fifteen minutes of this time the car will be within the city limits of Dallas, where lower speeds are compulsory. The main traffic will be express, but stops have been provided about every 2 miles to take care of the local travel. Initially 15-car equipments will be provided, these to be of the standard interurban type, each 50 ft. long, and equipped with four GE-75 (75 hp.) standard direct current motors equipped with the Sprague-General Electric type K system of multiple unit control. Each car will be further provided with General Electric air brakes and compressors.

Power for the new road will be generated by steam at McKinney, a town about midway between Dallas and Sherman, by two 1000-kw. Curtis steam turbo-generators, operated condensing, with steam at 150 lb. pressure and 125 degrees superheat. Three-phase current will be generated at 2200 volts and 25 cycles and stepped up for transmission to 19,100 volts by three 350-kw. air blast transformers. One transformer of the same capacity will be installed as a reserve. Air for cooling will be supplied by duplicate blower sets, one being driven by an induction motor, the other by a direct current motor. Each blower will have a capacity of 10,000 cu. ft. For exciting the fields two 35-kw. generator sets will be provided. The compactness and low maintenance charges of these machines adapts them particularly for exciting units.

Six rotary converter substations will be provided, including one at the main station, four distributed along the road, and a portable equipment, the latter comprising a special car containing a 300-kw. rotary converter, air blast transformers and suitable switching apparatus for cutting into the transmission system wherever necessary. Each of the stationary substations will be equipped with a 300-kw. 600-volt rotary converter, with the necessary switchboards, oil cooled transformers and lightning arresters. The substations will be interconnected by high tension transmission lines operated initially at 19,100 volts. Eventually, however, a transmission potential of 33,000 volts will probably be used. With a few exceptions the new line follows, in general, the standard direct current practice of the General Electric Company.

Contracts have already been let for one-fifth of the work on the New York State barge canals. The total estimate originally was \$101,000,000. The length of canals now under contract is 70 miles and the work was let at \$18,000,000, or \$2,000,000 less than the estimates.



### The Little Giant Corner Drill.

The Chicago Pneumatic Tool Company, Chicago and New York, now has ready for the market a new Little Giant pneumatic drill for corner work. From past experience in air tool practice the company claims to be justified in stating that this new drill surpasses any other drill yet devised for drilling in close quarters, and

ered, it possesses advantages over other designs of corner drills, owing to the spindle being driven by gears instead of by ratchet and pawl, which insures steady and constant spindle movement.

The accompanying engravings give a clear idea of the construction of the drill and its neat and compact design. The exterior appearance of the drill is shown in Fig. 1, and Fig. 2 gives a sectional plan and sectional

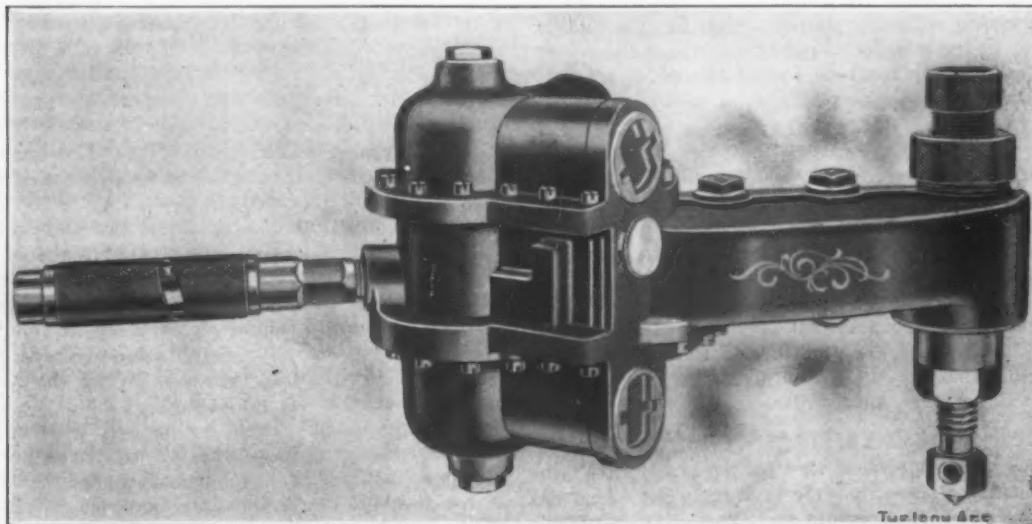


Fig. 1.—The Little Giant Pneumatic Drill for Corner Work, Made by the Chicago Pneumatic Tool Company.

in corners particularly, the machine having been designed especially for work of the latter class. The parts for the No. 4 Little Giant drill interchange with the new drill, thus insuring quick repairs.

This new tool weighs but 35 lb., has a nominal capacity for drilling  $1\frac{1}{2}$ -in. holes, but in emergency will drive 2-in. twist drills with satisfactory results. The spindle speed when running light is 150 rev. per min., and under

elevation which bring out all of the important differences between this drill and the Little Giant drills previously manufactured by this company, so that further description is hardly necessary.

The air motor movement and the handle controlling the inlet of air are unchanged, in principle at least, but where the drill spindle would normally occupy a position in line with or not more than once removed from the motor shaft three intermediate gear shafts are interposed. This gives an excellent opportunity for locating the speed reducing gears in a convenient manner and generally compacting the construction, so that the entire machine is of short length taken in the direction of the axis of the spindle. The case entire is oil tight, to hold lubricant for the motor and gears.

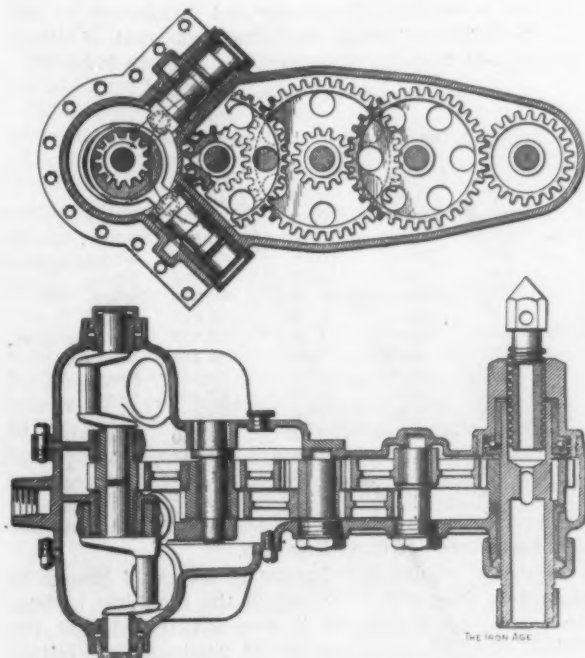


Fig. 2.—Sectional Views of the Little Giant Corner Drill.

load, with 80 lb. air pressure, 100 rev. per min. The distance from the end of the socket to the end of the feed screw when run down is  $5\frac{3}{8}$  in., the length of feed 2 in. and the distance from the center of the spindle to the outside of the housing 1 5-16 in.

According to the claim of the builder, in addition to being the most powerful drill ever built, weight consid-

**The Winona Technical Institute.**—The National Founders' Association has made a further contribution of \$500 to the School for Molding at the Winona Technical Institute, Indianapolis, Ind., and has employed a man at the expense of the association to obtain additional students for the school. The association's committee appointed to look after its interests in connection with the school—O. P. Briggs of Minneapolis, William Gilbert of Cincinnati and John L. Ketcham of Indianapolis—is also arranging to turn over to the students work for the foundries, so that they may earn money to meet partially the expenses of learning the trade. The National Founders' Association has subscribed \$3000, divided into scholarships of \$100 each, which students may borrow to pay their tuition fees, to be repaid when they have learned the trade and have obtained positions. Individual subscriptions from Pittsburgh people to the endowment fund of the Technical Institute at Indianapolis have now reached \$100,000. Dr. S. C. Dickey is president of the institute.

The Orphans' Court at Philadelphia has denied the application of a nephew of the late Charles J. Harrah of the Midvale Steel Company for his legacy of 220 shares of the company's capital stock. The Court sustained the contention of Charles J. Harrah, Jr., president of the company, that such a distribution would mean the loss of the control now held by the Harrah interests by a majority of 100 shares. It is stated that the estate holds 3300 shares of the stock, valued at \$656,137.34.



## The Influence of Carbon on Cast Iron.

The reports of the research work done by the Carnegie scholars for 1905-1906 has recently been published by the Iron and Steel Institute. Among them is one dealing with cast iron, by W. H. Hatfield of Sheffield. Its full title is "The Influence of the Condition of the Several Varieties of Carbon Upon the Strength of Cast Iron, as Cast and Heat Treated."

In connection with the preliminary work the author determined, under his special conditions, the influence of the varying silicon percentage and of the different casting temperatures. The results are taken up under the following five heads:

1. The condition of the carbon, as found in cast irons, as cast and heat treated.
2. The influence of silicon upon the strength of cast iron as cast.
3. The influence of the casting temperature upon the strength of cast irons, as cast and heat treated.
4. The influence of the condition of the carbon upon the strength of cast irons as cast.
5. The influence of the condition of the carbon upon the strength of heat treated cast irons.

These will be taken up in order.

### I. The Condition of the Carbon as Found in Cast Irons.

It is generally understood that carbon is found in two forms in cast iron—namely, free or combined. The free carbon may exist as graphite or "annealing carbon." The "annealing carbon" is apparently amorphous, finely divided carbon having some graphitic properties. It separates from white cast iron and certain steels during prolonged annealing. It is insoluble in dilute acids, and constitutes the "temper carbon" of Ledebur. Graphite is the carbon which separates from fluid irons, either previous to or during solidification, and at the solidifying point. It usually occurs as flakes or plates in the iron.

The combined carbon may be present in two forms: 1, As free cementite, carbide of iron,  $\text{Fe}_3\text{C}$ ; or, 2, as the carbide in the pearlite areas. Cementite is practically always present in iron castings as cast, and may occur in masses, membranes, plates or granules. It is the decomposition of the carbide that furnishes the annealing carbon.

Pearlite is also present, varying in variety from granular to laminated. These several conditions of the carbon constituents are well illustrated in the article by microphotographs.

In untreated cast irons, where the carbon is practically all combined, the structure consists of cementite and pearlite. Where the carbon is free, we find ferrite cut in all directions with plates of graphite. In actual cases the combinations of the different carbon constituents are exceedingly numerous. With white irons areas are occasionally found of gray iron; and in gray irons patches will show pearlite with free cementite.

White iron is the material usually heat treated, as in the production of malleable cast iron. A specimen which has been well annealed will show a background of ferrite with "annealing carbon" scattered through it. It is similar in some respects to wrought iron, with the separated carbon taking the place of slag.

The condition and properties of the annealing or temper carbon are not so well understood as those of the graphite, cementite and pearlite. Ledebur, in discussing a sample of American malleable cast iron, considered that it was still undecided whether the annealing carbon existed like graphite, as self-existent separated carbon, or as a component of some carbide, rich in carbon visible to the eye on the fractured surface, and which was decomposed with the deposit of insoluble carbon, when the iron was dissolved in acids.

The chief distinction that Ledebur makes is that annealing carbon is absorbed by iron much below the point of fusion, while graphite requires fusion. To test this theory the author took a sample of cast iron and attempted to convert graphite into combined carbon without fusion. The analyses are given in Table I. The annealing was carried out at 950 degrees C. to 1000 degrees C.

for 5 hr. A piece was quenched from that temperature. The effect of this treatment was that, whereas the sample was previously exceedingly soft, it became, after quenching, extremely hard and stripped the teeth from a file. A microsection showed austenitic hardenite. The sample was afterward tempered by being heated to 500 degrees C. and cooled slowly. Its microstructure was now composed of graphite, pearlite and finely divided cementite.

Table I.

State.	Graphite. Per cent.	Combined carbon. Per cent.	Silicon. Per cent.
As cast.....	2.4	0.8	2.5
Annealed.....	3.24	0.05	2.5
Hardened.....	1.65	1.60	2.5
Tempered.....	1.65	1.60	2.5

The foregoing results indicate that Ledebur's distinction between the two varieties of free carbon is not absolute.

With regard to the formation of annealing carbon, the author supports in general the theory of Arnold and McWilliam. This is briefly as follows:

During the slow cooling from 1000 degrees C. the dissolved cementite completely falls out at about 900 degrees C., and from this temperature downward gradually segregates into nodular masses. After the Ar. 1, 2, 3 change point, that of recalcence, the pearlite gradually becomes laminated. Then, acting over a certain radius of molecular attraction, the A, or cementite carbide, draws to itself part of the B, or pearlite carbide. This leaves a sphere of ferrite the boundaries of which mark the limits of attraction of the A carbide. Then, for some unknown reason, at a low red heat the whole of this segregated carbide decomposes into amorphous graphite and iron, thus giving annealing carbon and increasing the amount of ferrite already existing. The author finds that for the cementite of cast irons to throw out its carbon it is necessary to heat to a comparatively high temperature and believes that it is quite possible for the whole of the carbon to be precipitated above Ar. 1.

### II. The Influence of Silicon on Cast Iron.

The author's series of test bars were made from well-known English pig irons, and contained the commercial percentage of carbon, that is, from 3 to 4 per cent. They were low in sulphur, phosphorus and manganese, so that the only influence besides the carbon was that of silicon. The analyses, tests and fractures are given in Table II.

Table II.—Series A.—Silicon Results..

No.	Combined carbon. Per cent.	Graphitic carbon. Per cent.	Silicon. Per cent.	Ultimate stress per square inch. Pounds.	Fracture.
7	2.9	trace.	0.28	40,320	White.
8	2.9	trace.	0.53	51,072	White.
9	2.9	trace.	0.63	32,480	White.
10	2.9	trace.	0.66	30,016	White.
11	2.9	trace.	0.88	38,976	White.
12	2.9	trace.	0.90	40,544	White.
13	3.0	trace.	1.10	35,840	White.
14	2.7	0.28	1.43	25,733	Trace mottled.
15	2.3	0.65	1.68	25,536	Mottled.
16	0.6	2.47	1.72	28,448	Gray.
17	0.55	2.60	1.80	23,968	Gray.
18	0.55	2.68	1.96	33,376	Gray.
19	0.5	2.75	2.07	19,040	Gray.
20	0.5	2.75	2.19	34,944	Gray.
21	0.49	2.80	2.36	21,952	Gray.
22	0.48	2.85	2.50	20,204	Gray.

The manganese was not exceeding 0.20; the sulphur and phosphorus not exceeding 0.05.

The most remarkable feature is the rapid change of the carbon from the combined to the graphitic variety. From previous statements it was anticipated that the gradual addition of silicon would gradually precipitate the graphite. It would appear that the 3 per cent. of carbon present is easily held in combination until 1.43 per cent. of silicon is reached, when any further addition seems to decrease rapidly the dissolving power of the iron. The result is that the carbon is very quickly thrown out of solution, for the graphite percentage has almost reached its maximum with 1.7 per cent of silicon present.

If the results are plotted in a curve, a regular rise and fall to and from a maximum is not obtained. Instead, a most irregular formation is the result. The

general form seems to indicate that low silicon and high combined carbon give the highest tests when in tension.

The great irregularity of the individual tests is most surprising and may be illustrated by the following results:

No.	Combined carbon. Per cent.	Graphitic carbon. Per cent.	Silicon. Per cent.	Ultimate stress. Pounds.
8	2.9	trace.	0.53	51,072
9	2.9	trace.	0.63	32,480

These two specimens might both be called good samples of white cast iron, each showing a nice white crystalline fracture; No. 9 a little coarser than No. 8. Micro-sections of both were made and examined. This seemed to afford a solution of the difference in the tests. No. 8 shows a well mixed structure of cementite and pearlite with no particular formation, while in No. 9 we have the cementite arranged in coarse striæ running in different directions, generally forming angles of either 60° or 90°. It is presumed that these striæ will form lines of weakness in the test bar, and from this it would appear that the structure of the cementite is the cause of the comparative failure of No. 9. After examination of the series in the above manner, it seemed evident that the irregularity in the results could, practically, be always explained by some difference in the microstructure of the carbon constituents.

It was decided to make another series, with the object of confirming the results obtained. Its results are given in Table III.

Table III.

No.	Combined carbon. Per cent.	Graphitic carbon. Per cent.	Silicon. Per cent.	Ultimate stress per square inch. Pounds.	Fracture.
23	3.00	trace.	1.57	25,984	White.
24	3.00	trace.	1.71	21,056	White.
25	2.90	0.10	1.73	26,880	Slightly mottled.
26	2.91	0.11	1.80	24,640	Slightly mottled.
27	1.78	1.20	1.95	43,904	Slightly mottled.
28	1.50	1.47	1.97	27,776	Gray.
29	0.62	2.50	2.05	33,600	Gray.
31	0.55	2.55	2.31	18,816	Gray.
32	0.73	2.40	2.41	32,256	Gray.
33	0.75	2.30	2.50	29,344	Gray.
34	0.49	2.50	2.67	23,944	Gray.
35	0.51	2.55	2.82	18,345	Gray.
36	0.52	2.55	2.94	18,390	Gray.
37	0.47	2.60	3.05	19,408	Gray.

The manganese was below 0.20 per cent.; the sulphur and phosphorus below 0.05 per cent.

This second series shows clearly the rapid transformation of the carbon from the combined to the graphitic state. The obvious deduction from these two series of experiments is that there are influences of great importance other than silicon, which must be taken into serious consideration when producing irons of great strength.

### III. The Influence of the Casting Temperatures:

In carrying out the work due consideration was paid to the results obtained by Mr. Longmuir, with regard to the importance of the casting temperature. Six series of bars were made strictly comparable with those of the silicon series. Each series contained bars cast at a high, medium and low temperature, the temperature being controlled both by eye and the Wanner optical pyrometer. The results are given in Table IV:

Table IV.

No.	Combined carbon. Per ct.	Graphitic carbon. Per ct.	Silicon. Per ct.	Casting temperature. Deg. C.	Ultimate stress. Pounds.	Fracture.
A1	3.25	trace.	1.29	1,403 Hot.	30,016	White.
A2	3.25	trace.	1.29	1,250 Fair.	27,552	
A3	3.25	trace.	1.29	1,200 Too cold.	Not run.	
B1	3.16	0.1	1.52	1,403 Hot.	26,320	White, little mottled.
B2	3.10	0.16	1.52	1,300 Fair.	24,147	
B3	3.00	0.26	1.52	1,201 Cold.	16,800	
C1	1.5	1.8	1.70	1,403 Hot.	23,968	Gray, close, grained.
C2	1.1	2.19	1.70	1,250 Fair.	24,057	
C3	1.0	2.23	1.70	1,180 Cold.	25,812	
D1	0.80	2.50	2.00	1,366 Hot.	20,473	Gray, close, grained.
D2	0.71	2.61	2.00	1,215 Fair.	20,540	
D3	0.10	2.51	2.00	1,154 Cold.	18,900	
E1	0.70	2.60	2.30	1,300 Hot.	22,064	Gray, fibrous.
E2	0.74	2.55	2.30	1,215 Fair.	23,116	
E3	0.73	2.57	2.30	1,135 Cold.	16,934	
F1	0.80	2.40	2.50	1,290 Hot.	20,988	Gray, coarser grain.
F2	0.82	2.45	2.50	1,243 Fair.	16,867	
F3	0.80	2.40	2.50	1,216 Fairly cold.	10,040	

As before, the manganese was below 0.20 per cent, the sulphur and phosphorus below 0.05 per cent.

The castings were all made in green sand and allowed to cool before being knocked out. There is not such a clear confirmation of previous work as was expected. With the silicon at 1.52 per cent. there is a fall from hot to fair, and then a distinct fall to the cold sample. However, on examining the results obtained with the silicon at 1.7 per cent. the hot, fair and cold are of approximately equal strength. At 2.0 per cent. silicon there is a slight fall in the cold specimens. With 2.5 per cent. the strange fact is evident that the bar cast at the fair temperature is decidedly the weakest.

It is obvious that there is nothing very convincing in the foregoing tests, and one would infer that the casting temperature alone will not account for the great variations obtained in the mechanical tests of series A and B.

Bars from the casting temperature series were subjected to a severe annealing, being taken to about 1000 degrees C., cooled slowly, and then again tested. The results show that after heat treatment the variation that caused the differences in the tests in the hard state did not exist.

### IV. The Influence of the Condition of the Carbon on the Strength of Cast Iron.

Professor Turner, in 1888, wrote concerning a strong iron, "Many founders have held that it is possible to get any strength provided the metal is hard enough, and hence do not care to aim at strength for fear of getting the metal too hard. As a matter of fact, however, the irons with maximum tensile strength are always good, soft, close irons, just such metal as is preferred for general purposes in the foundry."

Professor Howe considers that the strongest iron contains an excess of 1.2 per cent. of combined carbon, together with 0.8 per cent. of graphitic carbon. This would be a hard mottled iron.

E. Riemers, in 1892, considered that gray iron was stronger than white iron.

These are sufficient to show that there is a great difference of opinion as to which iron is really the stronger. The results obtained by the author show that in the cast state the white irons invariably give good results. These irons, as noticed before, consist of thick membranes or walls of cementite, filled in with pearlite; and it was found that any great variation in the tests was explained by the condition of this cementite structure. The test bars giving high results consisted of a "well mixed" structure.

A feature worth mentioning is that the high silicon white irons seemed to be the most liable to form the dangerous structure.

The mottled irons of the various series give comparatively indifferent results, although occasionally an exceedingly good one is obtained, as in the case of No. 27, Table III.

The results from the mottled irons seem to be chiefly dependent upon the quantity, distribution and structure of the cementite. If it is in excess and well mixed, good results are obtained.

The gray irons, it will be noticed, give comparatively low results all through the research. They generally consist of pearlite cut up by graphite, with a little ferrite distributed through the field. The larger the amount of graphite, the weaker the iron, and the higher the percentage of combined carbon present as pearlite, the stronger the iron.

### V. The Influence of the Condition of the Carbon on Heat Treated Cast Iron.

The cast irons usually annealed are either gray or white. With gray iron the object is to relieve internal stresses set up by the shape of the casting, or to make the material softer for machining.

In annealing white irons the idea is to produce a malleable casting by decomposing the carbide of iron, and partly or altogether eliminating the carbon produced from it. In either case it will be found that the annealed casting consists microscopically of ferrite and graphitic carbon, with more or less laminated pearlite occurring through the mass.



The basis of the annealed castings is ferrite containing silicon, and previous research has shown that silicon does not materially affect the iron until 2 per cent. is reached. The author believes that the ductility or brittleness of annealed cast iron is due to the manner in which the free carbon is present. If it occurs as graphite in plates or membranes, then the iron is materially weakened.

In Table V is given an interesting series of experiments illustrating the varying effect of annealing carbon:

Table V.

No.	Combined carbon. Per ct.	Graphitic carbon. Per ct.	Silicon. Per ct.	Man-ganese. Per ct.	Sulphur. Per ct.	Phos-phorus. Per ct.	Deflection. Inches.
1	0.07	2.80	1.00	0.19	0.04	0.04	2 1/4
2	0.08	2.75	1.00	0.20	0.04	0.04	1 3/4
3	0.09	2.90	1.00	0.22	0.04	0.04	1 3/8
4	0.07	2.77	1.00	0.18	0.04	0.04	1 3/8
5	0.10	2.90	1.00	0.33	0.04	0.04	1 3/8
6	0.08	2.85	1.00	0.20	0.04	0.04	1 3/8

The bars were 18 in. long and 1 in. square. They were tested transversely on supports 12 in. apart. The fractures of all were gray, increasing in coarseness from No. 1 to No. 6. The annealing carbon steadily increased in size from No. 1 to No. 6, and the crystals of ferrite also. In No. 6 the nodules of free carbon are beginning to be arranged in distinct lines, which form lines of weakness in the test bars.

The following series of tests, Table VI, illustrates the relative unimportance of silicon, provided the correct condition of carbon is attained. The bars measured 3/4 x 1 x 8 in. and were hammered cold over a 3/4-in. radius:

Table VI.

No.	Silicon. Per ct.	Combined carbon. Per ct.	Graphitic carbon. Per ct.	Man-ganese. Per ct.	Sulphur. Per ct.	Phos-phorus. Per ct.	Bend/g angle. Deg.
A	0.45	0.05	3.10	0.20	0.05	0.05	95
B	0.90	0.06	3.11	0.21	0.05	0.05	98
C	1.10	0.05	3.11	0.20	0.05	0.05	94
D	1.88	0.07	3.05	0.19	0.05	0.05	89

The microsections of these bars show that they consist of ferrite and a little pearlite, speckled with small annealing carbon.

Finally, with regard to combined carbon, it was found that, as in the case of steel, its addition materially increased the ultimate stress.

G. B. W.

### Alzene and Its Properties.

An item describing the wonderful characteristics of alzene has been making the rounds of the press recently. It has been hailed as a new metal, or a new alloy, and all sorts of claims, both extravagant and otherwise, have been made for it. Its strength, ductility, elasticity and noncorrosive properties have been itemized, and it has been compared to steel, brass and pure aluminum as having the best qualities of each.

The alloy does possess certain remarkable features of a strictly physical nature, but it is not a new discovery, nor is there any secret in its composition. It was known and tested by competent authorities years ago and the results were then widely made known. The alloy can be made by any one having a set of scales to weigh the ingredients and a crucible to melt them in. No skill is required in the compounding. The proportions are two-thirds aluminum and one-third zinc, melted together. Prof. W. F. Durand of Sibley College, Cornell University, made an extended series of tests in the mechanical laboratory on the strength and other characteristics of alloys of aluminum and zinc in varying proportions. From these tests, which were reported in *Science* in the spring of 1897, he found that the best mixture was an alloy in the above proportions. This alloy, he found, had a specific gravity of 3.3, and its principal properties were ascertained as follows:

Tensile strength deduced from small bars.....	22,000
Maximum fiber stress deduced from transverse tests...	44,000
Modulus of elasticity.....	8,000,000

Comparative experiments, independent of the above, were made between small bars of this metal and similar bars of cast iron. The report states: "These exhibited the same general indications and apparently warranted the conclusion that this alloy was the equal of good cast iron in strength and its superior in the location of the elastic limit." The other general physical properties of

chief interest were thus enumerated: "The color is white, and it takes a fine smooth finish and does not readily oxidize. It melts at a dull red heat of about 800 to 900 degrees F. It can therefore be readily melted in an iron ladle over an ordinary blacksmith's forge or other open fire." It was found to be somewhat softer than brass and more easily worked, and it was not liable to clog a file. It was brittle, and not suited for parts requiring the toughness of brass.

Perhaps the most valuable aspect of the alloy is to be found in its casting qualities. It does not burn the sand into the casting and hence comes out clean and in good condition for the machining operations. It is exceedingly fluid and, according to the report above cited, runs "freely to the extremities of the mold, filling perfectly small or thin parts. In this particular it is much superior to brass."

Ten years ago the metal was thought to be well adapted for the small parts of machines, models, &c., where the necessary qualities were lightness combined with good finish, strength, stiffness and freedom from corrosion. It was employed with great success in the construction of small screw propellers for experimental work in the Graduate School of Marine Engineering, at Cornell.

### Advances in the British Iron Market.

An advance of \$1.50 in Cleveland pig iron warrants in three weeks is the very unusual record in Middlesbrough iron reported in recent British advices. On December 4 Cleveland warrants were 63s. 3d., as against 56s. 8d. on November 13. In the first week of December No. 3 Cleveland pig iron was sold by makers at 63s. 9d., as against 55s. in the early fall. The demand upon furnacemen has been greater than the supply for the deliveries asked, and the furnaces are well sold for two months ahead. Production is at a record rate, Cleveland District furnaces having added 300,000 tons in the past year to their production in the previous year. The export shipments of Cleveland pig iron in November were 144,741 tons, or 958 tons more than in October, making a new record. The shipments of pig iron from the Cleveland District this year to November 30 reached 1,384,528 tons, the largest on record, and 485,732 tons, or 54 per cent. more than in the corresponding period of 1905. Germany took 422,156 tons this year, against 143,466 tons last year; the United States 96,043 tons, against 49,716 tons; Belgium 50,686 tons, against 17,545 tons, and Italy 96,759 tons, against 63,368 tons. To Scotland 277,221 tons were sent, against 311,733 tons last year. East coast hematite iron and Scotch hematite have advanced at a rate equal to that of foundry iron, makers now asking 76s. 6d., as against 68s. in the early fall.

A Middlesbrough, England, market report of December 6 has the following concerning advances that have been made in finished materials: The bar manufacturers last week put up their quotations 5s. per ton, after keeping them stationary since the early part of the year. This week they have added another 5s. to their prices, which makes 10s. rise in a fortnight, and now common iron bars are at £7 15s., less 2 1/2 per cent. f.o.t. The Scotch makers on December 3 added 10s. to their prices, making common bars £7 17s. 6d., less 5 per cent., so that the prices in the two districts are practically identical. Heavy steel rails are up to £6 10s., net, f.o.b.; cast iron chairs to £4 2s. 6d., cast iron columns to £7—all very fair advances. Cast iron pipes are 5s. up. The recent advances in sheets are fully maintained. On December 5 the producers of plates in the north of England decided to advance prices 5s. per ton, that being the first change they have made since October, 1905. Steel ship plates are now, therefore, at £7 5s., and steel girder plates at £7 10s., and steel boiler plates at £8 5s., all less 2 1/2 per cent. f.o.t. An advance of 10s. per ton was looked for. Steel ship angles have been raised to £6 17s. 6d. and steel joists to £6 12s. 6d., both less 2 1/2 per cent. Iron ship plates are at £7 10s., less 2 1/2 per cent. f.o.t. Thus there is a general move upward in prices.



## Pistons for Internal Combustion Engines.

BY H. S. BROWN.

In designing pistons for internal combustion engines the following important conditions should be carefully considered. Is the engine to be horizontal or vertical? Is it for high or moderate speed? What fuel is to be used? How many cylinders? Diameter of cylinder bore? What service is the engine to be put to? In considering the above the following will take up lubrication, water jacketing, water connections, strength of the piston, molding and finishing, together with pattern construction and treatment afterwards.

If the cylinders are vertical the lubrication must be arranged accordingly. The lubricant should enter the cylinder as near as possible to the top of the piston when

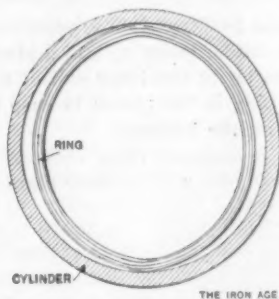


Fig. 1.—An Exaggerated Indication of the Consequence of the Wrong Method of Fitting Piston Rings.

at its lowest point of travel, so that the entire length of the piston will receive a sufficient supply to prevent cutting and keep the rings in good working condition. At the same time the oil must be prevented from being carried above the piston into the interior of the cylinder, where it will be carbonized and cause preignition. It is important that the oil enter at a number of points in the periphery of the piston, and spiral grooves should be cut to carry oil around to points where no entrance can be located.

The location of the grooves for the rings is of very great importance, as the high temperature will tend to destroy them if they are too near the end of the piston, and they will crumble into small pieces and cut the cylinder. The writer has found cases where the first ring has entirely disappeared, and after a comparatively short run. As an experiment the first groove from the end was filled with a special composition and the trouble was very nearly overcome. The rings should be made from selected cast iron, or what is termed gun iron. Not excessively hard, but very close in the grain. If the ring is made from an open porous iron the fire from the explosion seems to enter into the body of the metal and eat it away.

Great care should be used in fitting the rings as perfectly as possible to the wall of the cylinder. In most cases the rings are sprung over the end of the piston and dropped into the grooves, and are made enough larger than the inside of the cylinder to hold themselves firmly against the cylinder walls. From a number of years' practical experience the writer has found  $\frac{3}{16}$  in. to the foot a proper excess of diameter—that is, for a 12-in. cylinder, the rings should be roughed out to a diameter of  $12\frac{3}{16}$  in., then cut and closed to fit a special chuck that would hold six or eight rings firmly to an outside diameter of  $12\frac{3}{16}$  in., then turned to 12 in. By this means the ring will be a true circle on the outside and will fit the cylinder exactly, if care is used in placing them in the piston. If the rings are turned originally to  $12\frac{3}{16}$  in., then cut and placed in the piston, a condition as shown somewhat exaggerated in Fig. 1 results. This is a poor practice, as the gases will blow past the rings into the crank chamber, or out into the engine room, as the case may be. Sometimes the rings are cut and fitted to the cylinder by filing and scraping, but it is far better

to turn them. They should be made to hardened steel gauges and kept strictly to standard. The grooves in the piston should also be cut to standards, with just enough allowance to give play to the ring and hold it from clicking when the piston is in operation.

The rings should be made fairly deep, to allow for wear. That is, radially, the depth should be at least 25 per cent. greater than the face width. Rings that are thin radially will soon wear and after a few thousandths play the wear increases very rapidly. It is common to fit clips or short sections into the cut of the ring, to fill the open space, but the writer doubts the value of the practice, except in large engines running at low piston speeds, and then they should be inspected frequently, as they wear very fast, and soon small pieces break off and score the cylinder. Even the small pins that are fitted in the piston grooves to prevent the rings from turning in the piston are dangerous, as they rapidly wear away and finally break off.

To keep rings from turning in the piston an excellent scheme is to cast them in drums long enough to make 12 or 15 rings, with a rib as shown in Fig. 2. After pickling the casting and when finishing in the lathe it should be chucked by the inside so as to leave an even thickness without finishing the inside of the ring. The ring will be stronger and hold its elastic properties longer. In the piston a hole is to be drilled, to take the feather on the ring. This style of ring can only be used where a follower is fitted to the piston and in large diameters. In small pistons a plain ring without loose pieces is the safest.

If the engine is to be single acting and the rod connected to the piston by a wrist pin there should be ribs cast inside of the piston to prevent springing. These ribs, being located at the inner end of the piston, should not be very thick, as they are liable to produce spongy sections in the piston ring grooves. It is better to have several thin ones, and they should extend well down toward the center of the piston.

If the engine is of large power, with few cylinders, it is generally necessary to water jacket the inner end of

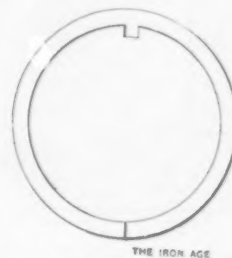


Fig. 2.—A Suggested Scheme for Preventing Rings from Turning.

the piston, and great care should be taken in designing the system for conveying the water to and from the jacket. The movement of the piston causes a swashing of the water, which is more effective when the jacket is not completely filled.

It is extremely difficult to keep water from escaping into the cylinders when a follower is used. The best arrangement is to cast the piston with the chambers or jacket in one piece and core small holes for the gases to escape from the core when the casting is poured, and also through which to remove the core sand. These holes should be reamed out and tapped to receive plugs, which should be of the same material as the piston, to prevent strains from the expansion and contraction caused by the radical changes of temperature in the cylinder.

Where the rod is connected to the piston by a wrist pin direct, it is very difficult to arrange the connections for water to the piston jacket. A good plan is to screw into the wall of the jacket inside of the piston a smooth pipe long enough to extend beyond the end of the piston through a stuffing box into a tank of water which may be made of 6-in pipe. The tank is to be completely filled with water under moderate pressure so that the supply

shall always be in excess of that required to keep the piston jacket completely filled. This will in a great

chamber, or in an open horizontal engine, Fig. 4, will answer the purpose. It will add to the first cost, but it is warranted by avoiding the repairs occasioned by insufficient lubrication at this point. The bearing being out of sight of the engineer needs some reliable provision, but whatever device is used the engineer should frequently inspect the bearing.

The steel for this pin should be high in carbon—not less than 0.5 per cent.—and manganese, 1.03 per cent. This will have a good hard surface that will stand the stress from the shock of explosion. The connecting rod boxes in the piston end should be made from carefully selected bronze metal well relieved on the side by filing or scraping, as it is the nature of a bronze half box to close in when exposed to high temperatures and pinch the pin. The bearing surface should be all in the crown and not exceed 30 per cent. of the half box. The writer has seen cases where the two half boxes were fitted from edge to edge on the pin and after a short run, from even a slight increase in temperature, would bind and stop the engine.

The pin should be fitted in the piston on a taper, so that lost motion can be taken up and a steel dowel pin or feather should be let in the large end of the pin, to prevent the pin turning in the piston in case the connecting rod boxes pinch on the bearing.

If the engine is designed for a constant load the temperature in the cylinder will be more regular and the pis-

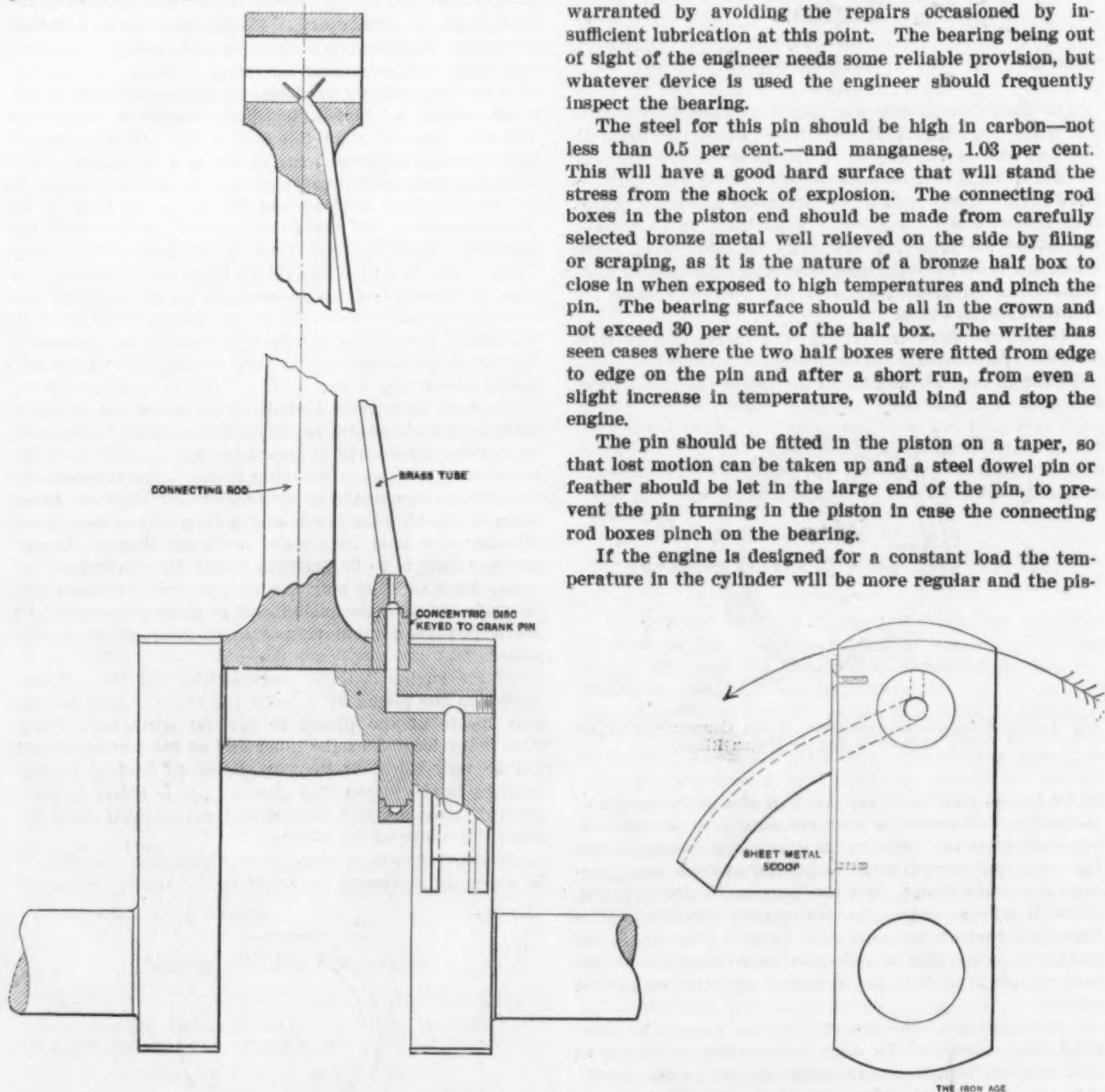


Fig. 3.—An Oiling Arrangement for the Bearings of a Vertical Inclosed Engine.

measure prevent the shock from swashing the water. The stuffing box for the pipe should never be placed in the piston, as it would then be necessary to shut down the engine to adjust it. The discharge pipe from the jacket should be located directly opposite the inlet, to prevent side strain on the piston, and should be connected similarly as the feed with free open drainage. In addition there should be a third pipe screwed into the jacket shell and capped over the outer end, to be used for washing sediment out of the jacket. By attaching a hose to the end of this pipe and forcing water through the jacket nearly all of the deposit may be thus removed. In some localities the piston jacket will fill up very fast and should be frequently washed out. There have been numerous cases where the jacket chambers on air compressors have so thoroughly filled that the water would cease to flow, and a cut or scored cylinder would be the result. In the case of the gas engine piston there is the additional danger of the piston cracking from the high temperature and consequent strains in the metal from expansion.

The oiling of the wrist pin in this style of engine is quite a problem. It requires a liberal supply of oil or the boxes will soon be badly scored. The oil should be of a fairly high flash point, so as to flow freely through the passage ways and not carbonize and fill them up. An oiling arrangement as shown in Fig. 3 will supply this bearing in a vertical engine having an enclosed crank

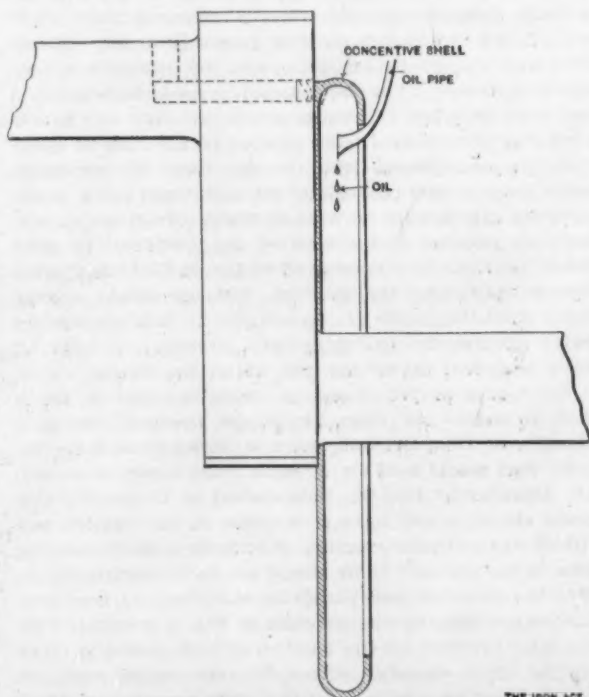


Fig. 4.—An Oiling Arrangement Applicable to a Horizontal Open Engine.



ton will be made lighter, as it will not suffer from so frequent and extreme changes in strain from changes in temperature. Where the load is intermittent all on or all off, the temperature will change accordingly, and the piston should contain more iron, so that the absorption and the radiation of heat will be less rapid. In this particular the gas engine is very different from the steam engine. Of course, if high speed is a factor, the effect of the weight in the reciprocating parts must be considered, but the destruction of the piston from extreme and sudden changes in temperature is equally important. It is a kindred matter of importance to have the piston of even thickness in the same relative parts, *i. e.* one side of the shell should not be thick and the other thin, as the heat will travel in proportion to the quantity of metal. For this reason when machining the piston in the shops it should be chucked by the inside and all unevenness turned off the outside.

In the foundry great care should be exercised in making the mold and tempering the sand. If the sand is unevenly tempered and the mold unevenly rammed there will be a firm side and a yielding side in the mold, resulting in a piston badly out of round, and a casting of this shape cannot produce a piston of even thickness. For good results it is imperative that the pattern be made of carefully selected, well seasoned stock, and the pattern must receive careful handling after it is made. It is ruinous to store it for days at a time in a corner of the foundry, exposed to damp sand, and not even turn it over.

In finishing the piston it should first be roughed out, including the grooves for rings, then heated evenly to a red heat and set in a pit and covered with ashes or other insulating material to prevent rapid cooling. This annealing will remove all strains and fit it for better service in the engine. Too much care cannot be spent in making up this detail of the gas engine. If the casting is open grained it is not fit for a piston and should be discarded. For small and medium sizes the castings should be carefully pickled. This will remove all traces of sand and give a clean surface for inspection.

#### A New Manufacturers' Liability Policy.

The Maryland Casualty Company, Baltimore, Md., is issuing what it calls the "Perfect Form" of liability policy. As one of a series adapted to different classes of liability insurance, it has developed the manufacturers' employees' policy indemnifying the manufacturer against loss from the liability imposed by law upon the assured for damages on account of bodily injuries, including death resulting therefrom, accidentally suffered by any employee or official while engaged in the occupations connected with the business of the assured manufacturer, including ordinary repairs. The premium is based upon the payroll, which includes all compensation of every kind earned by all employees and officials.

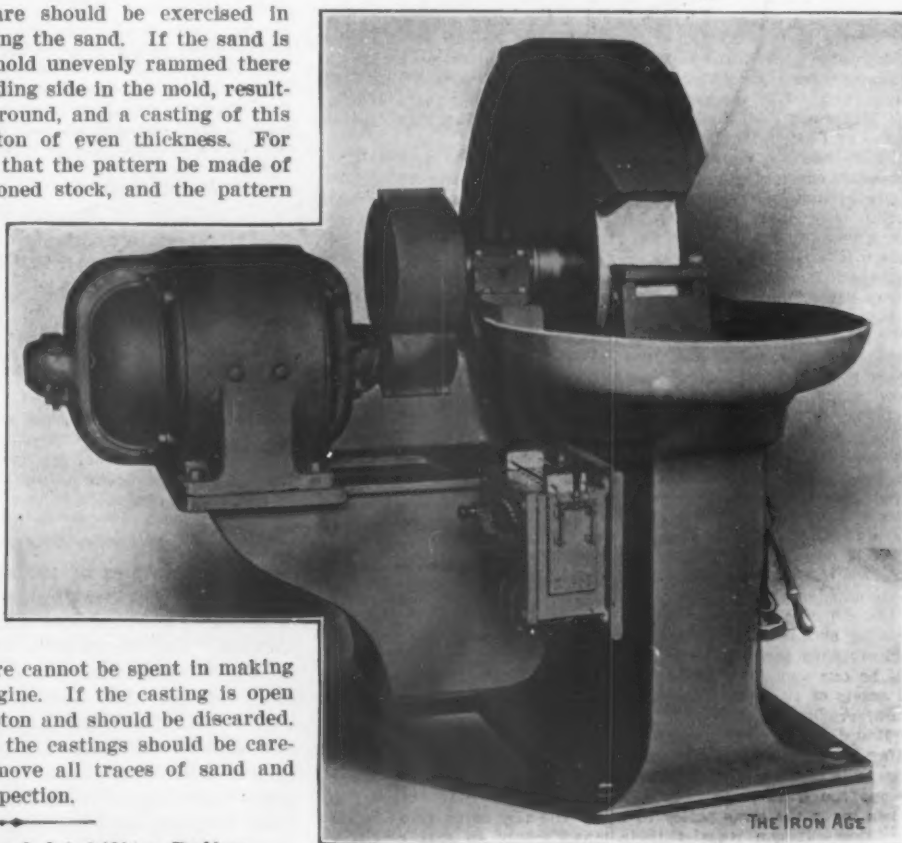
No warranties are required from the assured. The application calls for full and truthful statements over the signature of the assured as a basis for intelligent underwriting, but an honest error does not void the policy. All suits are defended, whether groundless or not. The company is not entitled to pay limit of policy and quit, but must stand by the assured. The company pays all expenses in addition to the policy limits. The assured is not limited as to the time of recovery at law from the company. There is no subrogation clause. The assured is not required to pro rate his insurance on account of policies carried in other companies. There is no forfeiture of insurance on account of change of title on the part of the assured. All cancellations are made pro rata. There are no short rate premiums.

#### A New Bridgeport Motor Driven Grinder.

A new style of motor driven tool grinder built by the Bridgeport Safety Emery Wheel Company, Inc., Bridgeport, Conn., appears in the accompanying illustration. It shows a No. 5 tool grinder with drop apron, driven by a 5-hp. direct current motor mounted upon a bracket cast upon the column of the machine. The motor, which may be of practically any make desired, is back geared to the emery wheel spindle with a ratio of about 3 to 1.

The grinder spindle has self-oiling bearings 8 in. long and supports a wheel 36 in. in diameter by 4 in. face. The floor space occupied by the complete equipment is 30 x 47 in. and the weight including the motor is about 2650 lb. The wheel is intended to run at about 425 rev. per min.

The gears are encased and all of the bearings are self-



A No. 5 Tool Grinder with Motor Drive, Built by the Bridgeport Safety Emery Wheel Company.

oiling, and in all it makes an equipment which is claimed to run very quietly. It is entirely allowable, if so desired, to start the machine in the morning when power is first turned on and to leave it running throughout the day, avoiding the time lost in starting and stopping each time it is necessary to use the grinder.

On the allegation that it is in debt more than \$2,000,000 the National Wire Corporation, New York, which has a large steel and wire plant in New Haven, Conn., was put in the hands of receivers December 19. The receivership was instituted at the request of the National Steel & Wire Company, which is the holding company of several works in various parts of the country. Henry L. Hotchkiss, president of the L. Candee Rubber Company, New Haven, Conn., and Homer Wise, vice-president of the National Steel & Wire Company, were appointed receivers. The cause of the company's failure is said to be insufficient working capital to carry on the large business. Plans to secure additional working capital have been under way for some months, to raise which a reorganization was planned, but owing to the state of the money market it has so far been found impossible to finance the new corporation.

## Criticism of Canada's Bounties.

### "The Iron Age's" View Considered.

TORONTO, December 21, 1906.—In the leading article of its Tuesday issue, the *Toronto Mail and Empire*, the chief organ of the Conservative party, deals with the editorial in *The Iron Age* for December 13, on "The Canadian Bonus and Iron Ore Development." The remarks of the *Toronto* paper are in part as follows:

It recognizes that we have promising ore fields, but it shows that these are passing into the hands of steel interests in the United States, which interests, it points out, have strong motives for continuing to reach out for Canadian iron lands as fast as these are discovered by prospectors. It instances the Moose Mountain range in Hutton Township, 25 miles north of Sudbury, which it says has become the property of United States steel capitalists, who intend to ship the output to the other side of the border.

Possibly the Moose Mountain ore, which is of superior quality, is all destined for the United States market, but in his speech at the Board of Trade banquet the other night, William Mackenzie stated that blast furnaces, open hearth steel works and rolling mills, to be furnished with material from the Moose Mountain range, would be established by his company in Toronto. Control of the mine there is supposed to be retained by the Mackenzie and Mann interests, notwithstanding that capital from the United States may be invested in it.

*The Iron Age's* statement that it was American rather than Canadian enterprise which brought to light the existence of Bessemer ore in really large quantity in the neighborhood of Port Arthur is probably correct. Certainly most of the product of the Helen mine, in the Michipicoten District, is disposed of to United States furnace owners. It is also said to be the intention of the Atikokan Iron Company to export ore from its range in the Rainy River District after providing for the needs of the furnace it is building at Port Arthur.

Unquestionably the United States Steel Corporation is on the keen lookout for new sources of ore, and it has acquired some areas that may one day become very productive. We do not know what grounds there are for the rumor—not noted in *The Iron Age's* article—that the hematite deposits near one of the arms of Lake Temagami have been secured by this corporation. All the known ore bodies of any importance in the United States are now in the ownership of the great steel manufacturing concerns. At the rate the steel works there are now consuming material, ore across the line will become scarce before many years pass, unless new deposits are discovered.

It is of the greatest moment to this country to see that no effective annexation of our iron ore resources is made by the steel industries of another country. Americans have the richest nicked deposits in the Sudbury District; they are maneuvering to bring as much as possible of the Cobalt territory under their capital; they have large slices of our natural iron wealth. It will be our own fault if they succeed in bringing these wonderful assets of the people of Ontario into dependence on American manufacturing industries.

Bounties on iron and steel will not keep our ore from gravitating to furnaces on the southern shores of Lake Erie or on the other side of Lake Huron. But whenever the situation becomes serious the Ontario Government can apply to the ores of the Crown lands the same policy to which the timber on those lands is subject—it can restrict their manufacture to this country. That brought saw mills from the United States to Ontario; in its due time it can cause a like transfer of pig iron smelters, steel furnaces and steel rolling mills.

The remarks of Mr. Mackenzie, to which reference is made above, occurred in a speech delivered by him December 14, at a banquet given by the Toronto Board of Trade in his honor and that of Mr. Mann, his chief associate in the building of the Canadian Northern Railway. Speaking of the branch of the company's line that has just been opened from Toronto to Parry Sound and is being extended beyond Sudbury, he said: "The line is now graded through to the famous Hutton iron range, 300 miles north of Toronto, which is now being developed. People from the United States who understand these questions tell me that the developing of these mines will in course of time enable the establishment in Toronto of blast furnaces, rolling mills, steel mills, &c., in getting their raw material from the Hutton mines. This city will then be the manufacturing point in steel and iron for all the territory now tributary to it."

### A Thunder Bay Man's Opinion.

In the last session of Parliament James Conmee, who represents the riding in which Port Arthur is situated, introduced a resolution to restrict the iron and steel bounties to the Canadian product of ores mined in British North America. This limitation would exclude the United States ores, now imported largely for the furnaces of the Algoma Iron & Steel Company at Sault Ste. Marie, Ont., but would leave eligible for bounty the Newfound-

land ores on which the Dominion Iron & Steel Company and the Nova Scotia Steel & Iron Company operate. It was not Mr. Conmee's purpose to divide the house on the resolution, which was therefore withdrawn after it had been discussed by several prominent members on both sides. The consensus, as shown by the speeches, was that the balance should be more strongly in favor of domestic ore, in order that the use of the latter might be promoted and the incentives to iron prospecting and discovery might be increased. Mr. Conmee had particularly in view the advantage of the iron resources of the districts of Thunder Bay and Rainy River.

The present arrangement of the bounties is a partial concession of the point urged by the Thunder Bay member. The bounty on the product of imported ore was not dropped, but was reduced relatively to that on the product of domestic ore. Mr. Conmee's opinion of the change was expressed in an interview published in a Port Arthur paper. He said:

One point which I contend should be settled is that the preference given to pig iron produced from Canadian ore be carried into the manufacture of structural iron and steel products of Canadian pig iron from Canadian ore. One dollar preference is now given to pig iron produced from Canadian ore. If this amount were divided, or, better still, duplicated, and half of it applied as a preference to iron and steel produced from metal which is the product of Canadian ore, it would have added greatly to the development of Canadian iron deposits.

### Favors Free Coal.

In respect to another matter affecting the production of iron and steel Mr. Conmee was also disappointed. He, like Mr. Clergue, had advocated the placing of coking coal on the free list. Though he is a supporter of the Government, he considers the continuance of the duty on this class of coal a mistake. He stated his views as follows:

I contended last year, and still contend, that to put the furnaces in Ontario on an even footing with the furnaces in the maritime provinces coal for coking purposes should be admitted free. Such a provision would not prejudice in any way the interests of the producers of iron and steel in eastern Canada, because they have the coal to produce their own coke.

### Farmers Oppose the Bounties.

Representatives of the Ontario Farmers' Association were heard on Tuesday by the Finance Minister, the Minister of Customs and other members of the Dominion Cabinet. The business of the deputation was to make known its dissatisfaction with some features of the new fiscal scheme. The reduction of the duty on harvesters and mowers ought, the spokesmen of the party said, to be extended to cultivators, threshing machines and other agricultural implements. The Ministers were told that, while the farmers appreciated the lowering of the tariff rates that had been effected, they had looked for a much greater modification of protection. Objection was made to the retention of the anti-dumping duty, and it was suggested that sworn invoices instead of market prices should be made the basis for duty on agricultural implements. The Ministers were assured that they would have the support of the rural districts for any further changes that might be made now or hereafter in the direction of free trade.

But the petition that was most strongly pressed was that the bounties on iron and steel be continued no longer than June 30 next, the date on which they would have terminated but for the Government's provision for their renewal. It was pointed out that from \$8,000,000 to \$10,000,000 had been paid out of the Treasury on this account, and the position was taken that after receiving so much public money the manufacturers of iron and steel ought to be able to maintain their industry out of their own resources. Mr. Fielding promised to give further consideration to the requests of the Farmers' Association.

C. A. C. J.

A St. Paul dispatch says that the State of Minnesota expects to raise to \$400,000,000 the taxable valuation of the Hill ore lands, in view of the basis on which the recent lease was made to the United States Steel Corporation. It is stipulated in the lease that the Hill interests are to pay all taxes. Heretofore, it is stated, the assessed valuation of the properties has been approximately \$30,000,000.



**The Gruva-Huntington Emery Wheel Dresser.**

A novel tool that serves two purposes is the Gruva-Huntington corrugator and dresser for emery wheels, made by the Challenge Machine Company, Incorporated, Philadelphia, Pa. The function of the Gruva cutter, the upper one in the illustration, is not only to dress and true the wheel, but to change the character of its cutting surface by forming inclined corrugations across the face of the wheel. A wheel of this form made by the Corrugated Grinding Wheel Company, which is allied with the Challenge Machine Company, was described in *The Iron Age* April 5, 1905, at which time there were given results of tests showing the increased speed of grinding possible with the corrugated surface. A piece of  $\frac{3}{4}$ -in. gray iron plate was ground for the same length of time, with the same pressure and by the same wheel, first with a plain face and afterward with the face corrugated. The depth of cutting in the first case was  $1\frac{1}{4}$  in. and in the second 3 in., a gain in rapidity of grinding of 140 per cent.

As may be seen, the Gruva is a one-piece cutter, having angular teeth of a peculiar form. In use the cutter is passed back and forth squarely across the face of the wheel in the usual manner. Even a light pressure will



The Gruva-Huntington Emery Wheel Corrugator and Dresser.

greatly improve the cutting properties of the wheel, but when harder pressure is exerted and full corrugations are cut the best results are obtained. Any wheel when so corrugated is greatly enhanced in value, but the best results are to be had from wheels at least two letter grades harder and 20 numbers finer than would ordinarily be selected for a plain wheel.

The effect produced by the Huntington cutter is limited to restoring the cutting face of the wheel to its normal condition. It is useful for very small wheels, and for wheels suitable for removing a small amount of material. The cutter consists of two loose disks and four loose pieces having straight teeth. Both of the cutters revolve on loose pins whose ends turn in hardened steel bushings, these pins being retained by ears or stops secured to the outside of the handle, permitting free movement of the pins and cutters and reducing the wear. Besides carrying two forms of cutters, thus meeting the needs of wheels of any size, shape or composition, the handle is so designed as to permit the operator to stand to one side, where he is less exposed to danger and avoids the dust. Changing from the use of one cutter to the other merely requires turning the tool over.

One of the principal objects in combining the new Gruva and the old Huntington dressers in one tool is to get the former tried in shops which are only familiar with the Huntington, and perhaps too well satisfied to care to experiment with something new.

The State Engineer estimates that when the present good roads improvement plans are carried out in New York State, under the \$50,000,000 bond issue voted by the people, 7500 miles of the main highways of the State will be improved. Already surveys and plans for the improvement of 2500 miles of main roads have been approved. Of these 2500 miles 800 miles have been finished and 600 miles are under contract, the work to be completed next year. Thus far \$7,500,000 has been spent on improving main highways. It is estimated that 10 years more of road improvement on the present scale would put any farm in New York within a few miles of an improved main road.

**The Divine Brothers Company's Polishing Wheels.**

The Divine Brothers Company, Utica, N. Y., is claimed to be alone in the United States in making the manufacture of polishing and buffing wheels its exclusive business and in being able to furnish a complete outfit of these goods for polishing and finishing any metal article from a gold ring to a locomotive. The company started in this field about 12 years ago and has since devoted its entire energy to the one line and now claims the distinction of being the largest house in the United States manufacturing polishing and buffing wheels. It is true that they are made by others, but of these several only manufacture the common types, and others conduct the business as a department or side line of a different trade. It is not uncommon to find large metal working factories buying second-hand canvas and other materials for making their own polishing wheels simply because they have not known of any establishment in a position to furnish their special requirements.

The Divine Brothers Company has a large factory, equipped with a complete modern outfit of machinery, much of it specially designed, for the production of every known kind of polishing or buffing wheel, ranging in sizes from 1 to 40 in. in diameter. The company confines its attention to the manufacture of first-class high grade goods and has built up its present business entirely on the merit of the goods manufactured.

The compress polishing wheel, which it manufactures and claims to be the best type of polishing wheel known, is used by hundreds of the largest metal working concerns in the country. These wheels are distinctly and radically different in principle and construction from other kinds of polishing wheel, and are made from various materials, suiting any class of work from the hardest roughing to the finest finishing. They are manufactured with an iron hub, carrying a pair of steel plates, into which is forced under great pressure a ring 1 or 2 in. deep of various polishing materials, principally leather, canvas, felt, walrus, rubber composition or paper. The construction of the wheel permits it to be varied to suit any working conditions in polishing. No stock wheels are made, every wheel being designed and manufactured expressly for the work it is to do, just as machine tools are designed and built. Practical men appreciate the advantage of such methods over the old system of covering a wood wheel with a strip of leather and trying to do every class of work on one type of wheel. The polishing material referred to is placed on edge, which gives a cushioned effect to the wheel, and also permits the glue holding the emery to work into the fibres and thus insures the holding of the emery on the wheels. The compress wheels manufactured by this company are not new, having been on the market from 12 to 15 years, but they have been little advertised, due to the fact that for several years, or until the company moved into its present plant in May, 1906, it had more business than its old quarters could accommodate. In response to inquiries of compress wheel users asking for opinions of the wheels, results have been disclosed which even surprise the company making them. Some of those replying state that they have used the wheels continuously for 10 to 12 years and have the original wheels still in use. Others write that they are doing from two to four times the amount of work on compress wheels that they were able to do on other wheels.

By devoting its entire attention to this business and keeping in close touch with all phases of polishing this company naturally is in a better position to furnish precisely what is wanted and to suggest and improve upon processes than if the manufacture of polishing wheels was only an adjunct to some other line. The company does a great deal of consulting with concerns adopting new lines of business, or desiring to improve upon and change their old methods or decrease their costs of production. In the experience thus acquired it has not been uncommon to find concerns manufacturing almost identical lines of goods working with exactly opposite methods in finishing them.

## The Chain Planer Bolt.

The title unfortunately gives an inadequate name to the bolt herewith illustrated, which is a combination of a chain and ordinary screw bolt, making a flexible, adjustable device, capable of a range of application far

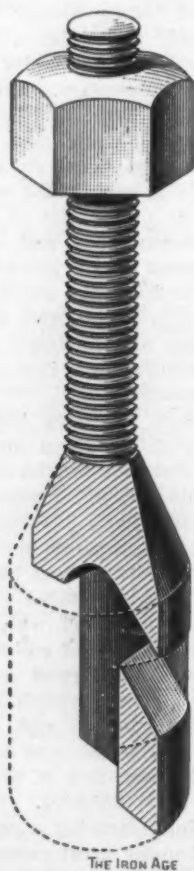


Fig. 1.—Sketch Showing the Construction of the Chain-Locking Member of the Bolt.

greater than that of an ordinary rigid bolt. One of the most important of its uses, however, and the one from which it gets its name, is the clamping of work to the bed of a planer. A closely allied function is the holding of work to the face plate of an engine lathe. Other uses will suggest themselves, such as the drawing of liners into cylinders, &c. In short, it is applicable to any pur-

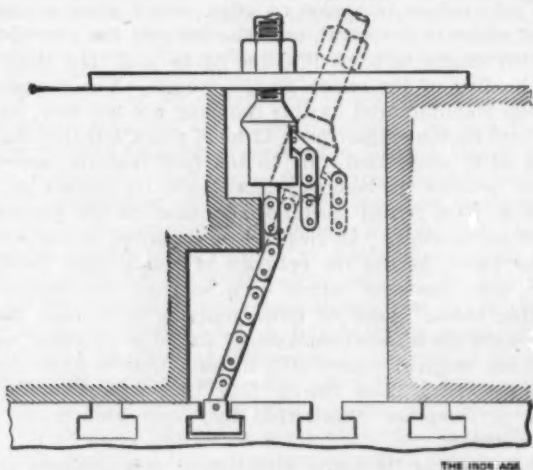


Fig. 2.—The Bolt Used to Hold Irregular Shaped Work to a Planer Bed.

pose for which a long screw bolt is necessary. The bolts will be handled by Patterson, Gottfried & Hunter, New York City, and will be made in sizes ranging from  $\frac{1}{2}$  to  $1\frac{1}{4}$  in. in diameter of the threaded part.

It would be even simpler and more exact to describe the bolt as a screw bolt with its head attached by a flexible chain of alterable length. This, however, applies to but one form in which it is made. Another uses two of the parts, such as shown in Fig. 1, with a chain be-

tween, when it becomes a U-bolt of any length and distance between legs. Still a third construction moves the threaded part to the opposite end of the chain, when the chain locking member becomes the head of the bolt. The preference for this form over the first depends on circumstances of convenience only. In perhaps the greater number of instances either would do, and they might be used interchangeably.

The body of the bolt is of a special construction to provide the chain locking feature, as may be seen in Fig. 1. This part is a casting or forging, preferably the latter, and is adapted to allow a flat link chain to be

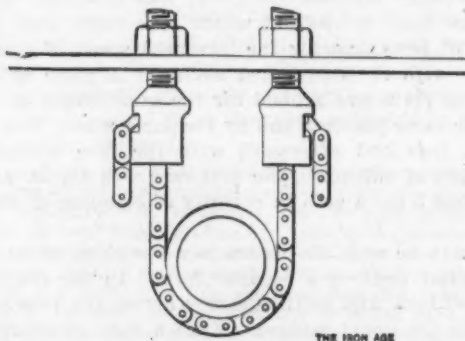


Fig. 3.—A Modification to Form a Flexible U Bolt.

freely passed through it, except when the chain is under tension. Then the link at which the bend occurs becomes cramped within the slot through which the free end of the chain passes, locking the chain. Any finer adjustment of the distance between the parts held together by the bolt is taken up by the nut, the threaded portion of the bolt being longer than the length of a link of the chain. The chains will be of corresponding strength to that of the threaded portion of the nut, so that they will not break before the threads will strip. The tee head will also be of a size corresponding to the diameter of the threaded part of the bolt and be preferably a forging.

For small sizes the part, Fig. 1, will be made in one piece, while for larger sizes the screw will be made separately and tapped into the block. For larger sizes

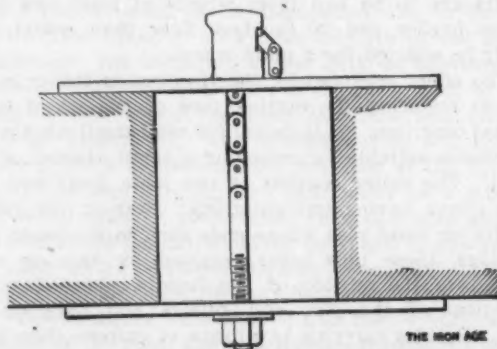


Fig. 4.—A Modification in Which the Chain-Locking Member Becomes the Head End of the Bolt.

a difference in the style of chain is also recommended, one of the solid link type being more desirable than a multilink or sash type chain, and in some cases a standard oval link chain may take the place of either. This requires a passage of cross form in the block and allows the inserting of a wedge in the first exposed link at the free end of the chain, to supplement the holding power of the block, but usually the bite of the block will suffice.

When the bolt is used for drawing a liner into a cylinder the head end of the chain is frequently extended with a rod to give a reduced section to pass through a hole in a clamping plate should this be of advantage. This clamping plate is placed across one end of the cylinder and a second one across the opposite end of the liner, and the bolt connects the centers of both. By tightening the bolt the liner is forced into the cylinder, and each time that the length of the thread is used up the nut is retracted and another link drawn through the bolt block.

Fig. 2 illustrates an application where the flexibility of the bolt is of special service, the bolt being used at an



angle impossible with an ordinary clamping bolt. Fig. 3 shows how two blocks may be used with one chain in the supporting of a pipe or other object. In a similar way it may be used for clamping around any irregular body upon which no hold is obtainable with the head or nut end of a straight bolt. It may thus take the place of a strap and two ordinary bolts. In Fig. 4 the block as used without the threaded part is shown, where it merely serves to lock the chain, and the nut for tightening is applied on a threaded stem attached to the opposite end of the chain.

### The International Rail Syndicate.

Negotiations are reported to be under way looking to the renewal of the International Rail Syndicate, which was formed in 1904 and which expires in June, 1907. It includes the principal producers in Great Britain, the rail mills in the German Steel Syndicate and those in Belgium and France. An arrangement is also understood to exist, governing rail exports from the United States. When it was formed the Rail Syndicate fixed the export prices of rails at £4 5s. to £4 10s. per ton at the port of shipment. To-day the price is from £5 15s. to £6 per ton. The advance of £1 10s. is to be attributed rather to general conditions in the iron trade, particularly the advances in raw materials and labor, than to any syndicate influence. In discussing the questions arising in connection with the proposed renewal of the syndicate agreement, the *London Engineer* makes the following interesting comments, which have been amended to the extent of changing the figures to include October exports of the United States, the original statement being for the first nine months of the year:

The question of price is not everything if the export market has to be temporarily neglected by the rail constituents of one nation—when they have secured orders representing the maximum tonnage of their allotments for the time being—in order to allow the other parties who may be in arrears to reach the percentages to which they are entitled. It is precisely this position of affairs which is believed, under the present division of markets, not to have been relished by the British firms, as they have been compelled to hold aloof from certain contracts so as to permit others to clear off arrears. How the rail convention has operated in the current year is demonstrated by the fact that the exports from the United Kingdom in the first ten months declined by 71,000 tons, as compared with the corresponding period of 1905, the figures being 393,000 tons and 464,000 tons, respectively, while the exports from France diminished by 3000 tons in the same period. On the other hand, the exports of rails from Germany, which amounted to 171,000 tons in the first eight months of 1905, advanced to 222,000 tons in the same term of the present year, being an increase of 51,000 tons, and a further augmentation is reported to have taken place in September and October. The exports from the United States in the first ten months of this year were 273,009 tons, as compared with 249,941 tons, and those from Belgium were 135,000 tons in the ten months, as contrasted with 111,000 tons in the equivalent period of 1905, being advances of 23,000 tons for the United States, and 24,000 tons for Belgium. These figures represent a total gain of 98,000 tons for the three countries in question, whereas Great Britain has incurred a loss of 71,000 tons.

Fresh competitors in the markets of the world have arisen since the conclusion of the existing agreement in 1904. These are the Spanish Altos Hornos, of Viscaya, one or two Austrian rail rolling mills, and one or two Russian works, while the advent of a firm in the North of England is of more recent date. [The Cargo Fleet Iron Company, Middlesbrough, which took a 100,000-ton order for Argentina and is now reported to be included in the Syndicate.—THE EDITOR.] If the Rail Syndicate is to be renewed it will probably have to include these outside firms, excepting, perhaps, the Russian producers whose appearance as successful competitors was due to exceptional circumstances. The question arises whether it would be of advantage for the British constituents

to continue the arrangement. Apparently the initiative in the matter of prolongation has emanated from the German Steel Syndicate, the representatives of which are reported to have been authorized to agree to the conclusion of a new agreement on the basis of the existing convention for a period of five years, although on the condition that if the German Steel Syndicate itself is not renewed on the expiration of the present contract at the end of June, 1907, the Teutonic interests should have the right to give notice to terminate the Rail Convention on December 31, 1907. In the circumstances, it would seem that the proposal for prolonging the Rail Syndicate needs exceedingly careful consideration on the part of the British constituents before they again decide the question of committing themselves to the scheme.

### Customs Decisions.

#### Duty on Fish Hooks.

A decision of much interest to importers and manufacturers of spear point fish hooks has been handed down by the Board of United States General Appraisers in the protest case of William Mills & Son, New York. The customs tribunal partly sustains the contentions of the importers and decides that fish hooks made from round steel or iron wire smaller than No. 18 Birmingham wire gauge are dutiable at the rate of  $1\frac{1}{4}$  cents per pound, plus 40 per cent. ad valorem, as articles made from wire valued at more than 4 cents per pound. On the other hand, the board rules that similar hooks of larger size are dutiable at  $1\frac{1}{4}$  cents per pound in addition to the specific rate provided in paragraph 137 of the tariff law, according to the actual gauge of the wire.

In his decision for the board General Appraiser Fischer says that the principal question for the tribunal to determine is the value of the wire from which the hooks are made, because of the obvious fact that the rate of duty to be imposed on the hooks depends on such value. Under these circumstances, it was a matter of regret to the Board of Appraisers that there were no witnesses produced before the tribunal who could testify of their own knowledge as to the value of the wire, the record on that point being made up exclusively of affidavits, "which carry much weight, as the declarations of British merchants are invariably accorded by the board." The general appraisers also had access to a report made by agents of the Treasury Department and the American consular officers in Birmingham and Redditch. The decision says:

Affidavits are, of course, a very unsatisfactory kind of evidence in which to make a finding as to such a fact as is here in dispute. Besides the general objection that no opportunity to cross examine is afforded the adverse party, to which all affidavits offered as evidence are open, those which have been submitted in the cases at bar are further objectionable in that all of them are in the importers' interest as against the Government's. All of them are made by parties peculiarly interested in their being accepted as strictly true, and, finally, they exhibit serious divergences in the declarations as to the value of the wire in similar sizes and styles of hooks. Generally speaking, the finer a wire is drawn, the greater is its value per pound, and it is consequently perplexing to find such a variance in the statements of the different manufacturers, some of them admitting that a 6-0 hook is the smallest that can be made from wire valued at 4 cents per pound or less, while one claims that he can make hooks down to a 4 from such wire.

Protests dealing with the classification of wire fish hooks imported by Abbey & Imbrie and others, New York, were overruled by the board on the ground of insufficiency, it being held that the protests failed to mention the rate of duty desired.

#### Galvanized Iron Sheets.

Protests against the assessment of duty made by the Collector of Customs at San Francisco upon importations of galvanized iron sheets imported by Parrott & Co. and Hugh Craig have been overruled. The sheets, which were corrugated, were assessed for duty at the rate of 45 per cent. ad valorem and 2-10 cent per pound additional. It was claimed by the importers that the merchandise should be allowed to enter at 1 3-10 cents per pound. It is found by the board that the sheets are valued at more than 3 cents per pound, whereas the paragraph quoted by the importers refers to material worth 3 cents per pound or less.





for their own good and for the good of the country. The National Government has accomplished something in relieving the condition, and private enterprise has done a good work in this direction, but all this has been on a comparatively small scale. The States, acting on some such plan as that of South Carolina, can accomplish much more, because each community knows its own needs and the State can act for it and select its new citizens with these needs in mind. Greater pains would probably be taken in selection; less of the undesirable element would be brought over and more of the desirable. Doubtless the imposition of stricter requirements for admission into the country would work well in connection with such a general system. The employer would have his State to go to, acting with its authorized agents, in order to secure the workmen which he might need in bringing his force up to its standard of efficiency.

The city of Boston is seeing an excellent illustration of prevailing conditions of distribution of labor, which is doubtless largely due to the concentration of immigrants in a large city. The State of Massachusetts recently opened a free employment bureau in Boston, and thousands of men applied for work within a few weeks, including hundreds of able bodied workmen, most of them unskilled, however, who would have no difficulty in securing work in some of the smaller cities and the towns of the commonwealth, to judge from the present experience of their local labor bureaus. The rural communities need their services also, and this is a condition much more pronounced in some of the Western States, which would absorb many times the number of men who are clamoring for work in Boston.

Probably an effort will be made to amend the national law to include the States with the individual and the corporation in the provisions of the alien contract labor law. But it should not be forgotten in considering such an amendment that there is a vast difference between the State on the one hand and the corporation or the individual on the other. The State is acting in a broad way for the betterment of the condition of its industries and through them of the public at large, while the individual, acting for himself as the officer of a corporation, is influenced by the demands of his business alone. It should also be considered that conditions to-day are not what they were when the contract labor law was enacted, and perhaps American labor has less need of its protection.

### A New System of Machinery Stock Orders.

Machine tool dealers are adopting a new system governing the placing of stock orders by dealers. Under this system stock orders are accepted only at ruling prices at date of sale by dealer to customer, if the sale be made before the machines are ready for delivery, or at date of invoice to dealer. The system gives the manufacturer a quicker response to changes in prices, which in the present market means earlier profits from advances. It gives to the dealer protection against a falling market, which is carried further by some manufacturers by a system of rebates to act when prices fall after the dealer has the machines on his floor. Several of the machine tool builders have been using this method for a considerable time, others have adopted it in the past six months, and still others have more recently notified their dealers that hereafter this will be their rule. Those who have tried it, both manufacturer and dealer, assert that it has worked out most satisfactorily in practice. Manufacturers are now getting present prices for some machines that were ordered by dealers months ago, when much

lower prices prevailed, which is an impossibility under the old practice.

By the old method the dealer places stock orders at prices prevailing at the date of the order. If the market advances he nets the difference above the amount of his discount, while the manufacturer has to wait for his benefit from the rise until he shall have filled the orders on his books. The speculative end of a stock order rests with the dealer. Under the new system it is transferred to the manufacturer. It is he who must stand the loss in a falling market, but it is also he who reaps the fullest advantage of a rising market.

But the manufacturer gives to the dealer *quid pro quo* for whatever advantage the latter may have lost. The dealer is protected against a fall in prices even after a machine has been delivered to him and is paid for. An excellent illustration of this lies in the contract existing between one of the largest machine tool builders of the Middle West and his dealers. It contains the general provisions of the system as already outlined, and in addition provides that if, after a machine has been delivered to a dealer, it is sold within 90 days of date of invoice, and if the manufacturer's price has dropped in the interim, he will rebate to the dealer the difference between the price prevailing when he bought and that at which he sold.

To illustrate the working of the system we will presume that the price of a machine January 1 was \$1000; that on March 1 it advanced to \$1050, and on May 1 it advanced again to \$1100. Then a sudden condition of the market caused a drop in prices on June 15 to \$900. The dealer placed an order for three of these machines January 1. He sold one to a customer February 15 when the price was \$1000; a second to another customer March 15, after the first advance had taken place, the price being \$1050, which the manufacturer received less discount to the dealer. The third machine was not sold when it was ready for delivery May 15, after the second advance had been made, and it was shipped to the dealer who paid for it on the basis of \$1100. He finally found a customer for it July 1, but the price had meantime dropped to \$900, or \$200 less than it was when the machine was paid for. But he did not stand the loss. Instead, the manufacturer credited him with the amount. Under the old system the dealer would have made an additional \$50 on the second machine sold, but he would have had to stand the drop of \$200 on the third machine. This is rather an extreme case, but illustrates the point in view. Other manufacturers have much the same system of rebates, a few placing no limit upon the time during which the rebate protection holds good.

The dealer, protected against a drop in prices, is encouraged to lay in a stock of machinery regardless of possible radical changes in industrial conditions. Of course, he would not buy as heavily if he believed the market threatened to decline to a serious extent. But there would be less disposition on his part to reduce his stock to the lowest possible point, in the fear of losing money if he should buy at prevailing prices, and in the hope of making money by waiting and buying in a lower market. He knows that if he purchases he will be protected against loss. His floor acts in a way as a storehouse for the manufacturer's machines, and they are paid for, which gives the manufacturer the use of money which would otherwise be unavailable. To be sure, he may have to give a rebate later on, but even with that reduction the price received will be as great as if he had carried the machine in his own stock and had himself sold it at the lower price. It is stated that the system

decreases to an extent the likelihood of cancellation of orders, and dealers believe that it will also have a deterring effect as to the cutting of prices by manufacturers in a falling market. At all events, both manufacturers and dealers who have had experience with the system profess to be well satisfied with its workings.

## CORRESPONDENCE.

### The Special Machinery Commissioner.

To the Editor: I know you are always very careful to try and have the articles in your paper accurate and based upon facts, but I noticed under the heading, "A Special Machinery Commissioner," in the issue of December 20, you state that "the American Protective Tariff League, of which Charles A. Moore of Manning, Maxwell & Moore, Incorporated, is president, originated the idea." The American Protective Tariff League is charged with a good many things, but it had nothing whatever to do with that proposition. It originated entirely outside of that body, which knew nothing about it, more than my own knowledge. I interested representative machinery manufacturers to write to the members of that committee, urging it, and I do not wish you to charge the American Protective Tariff League with being the instigator of it, as it might convey a wrong impression.

C. A. MOORE.

NEW YORK, December 21, 1906.

### Pacific Coast Freight Rates High.

SAN FRANCISCO, December 17, 1906.—The rebuilding of San Francisco has many unexpected results. One of the principal, outside of the demand for material, is a serious advance in freights in the coast trade. In some instances this has run up all the way from 50 to 100 per cent. The demand for vessels to be used in the lumber trade has brought this about. Enough vessels cannot be had and lumber freights from Puget Sound and the Columbia River have run up from \$4 to \$9.50 per 1000 ft., equal to nearly the same per ton of average merchandise. Those who have merchandise to ship are thus placed at a disadvantage. Fortunately an enormous amount of iron, steel, nails, hardware, &c., is wanted in the rebuilding of the city, so that the same business can be done with only the railroad freight from the East to be reckoned on. But the coast trade has to be kept at all hazards, so that our hardware and machinery houses have to make the best of the situation that they can. A great many new vessels have been put on, especially in the lumber trade, but still freights continue to climb. And the coast service is not a bit better by rail. There is more freight to be carried and cars cannot be got. Of course, with winter now on us, this will not be as seriously felt as at other times, but the trouble will be felt with renewed force in the spring. This has led to unusual activity in shipbuilding, and there are now not less than 20 steam schooners being built at various points on the coast outside of San Francisco. These will all come to San Francisco to receive their machinery at the Fulton, the Risdon and the Union iron works in about the order named. These vessels and those still to be built during the year will take not less than \$1,000,000 worth of machinery, so that in this one line our foundries will have quite a prosperous year. As regards machinery in other lines, there will be a great demand from the Goldfield, Tonopah and Manhattan mines. The last particularly are an unknown quantity until machinery in sufficient supply has been placed on the ground to test the values of the ores now on the dumps. The interest that this has for Eastern people particularly may be understood when it is known that from \$500,000 to \$1,000,000 a day has been sent from the East to our banks here to be invested in the stocks of southern Nevada mines. The value of the gold produced here for the year is variously estimated at \$12,000,000 to \$20,000,000.

Statistics are now available in regard to the work of rehabilitation. These show that permits have been

granted for about 6000 buildings since April 18, the value of these being about \$31,000,000. Of buildings with steel frames, of reinforced cement, brick, &c., the value has been about \$13,750,000, and of those where iron and steel constitute the principal part of the material about \$20,500,000. But there are at least a dozen reported and for which permits have not yet been applied which will make as much. New ones are cropping up every day, as, for instance, the First National Bank, which will have a 10 to 12 story structure of steel and cement on the corner of Post and Montgomery streets. The buildings for which permits have been issued will all go up within a year, most of them in six months. At the rate at which building has been going on, it will take about five years to restore the 26,000 houses destroyed by fire. The amount of insurance actually paid up to the present is about \$180,000,000. About \$33,000,000 never will be paid. Of about \$20,000,000 which will be paid some is still unsettled, but it is expected that disposition will be made of it before long.

J. O. L.

### Extreme Activity in Coke Oven Building.

A larger number of coke ovens is now under erection in the Connellsville and adjacent regions than at any time in the history of the coke trade. Work on these new ovens is being restricted to some extent by the scarcity of labor, but it is expected that fully half of them will be ready for making coke in April or May of next year. We give below a list of those building new ovens, together with location and number, as follows:

Name.	Location.	No.
H. C. Frick Coke Company.....	Various plants.....	1,000
Republic Iron & Steel Company....	Republic, Pa.....	100
Conn. Central Coke Company.....	New Salem, Pa.....	200
Century Coke Company.....	Brownsville, Pa.....	50
Fayette Coke Company.....	Shamrock, Pa.....	60
Keystone Coal & Coke Company...	Greensburg, Pa.....	140
Marietta-Connellsville Coal & Coke Company .....	Ligonier, Pa.....	40
Pittsburgh Coal Company.....	Grindstone, Pa.....	600
Washington Coal & Coke Company...	Star Junction, Pa.....	100
Midland Steel Company.....	Midland, Pa.....	240
Jefferson & Clearfield Coal & Iron Company .....	Earnest, Pa.....	250
Company .....	Homer City, Pa.....	400
Vinton Colliery Company.....	Vintondale, Pa.....	150
Jones & Laughlin Steel Company...	Aliquippa, Pa.....	1,200
	Soho, Pittsburgh, Pa.....	200
Mt. Pleasant Coke Company.....	Beatty, Pa.....	300
People's Coal Company.....	Brownsville, Pa.....	400
Jas. W. Ellsworth Coal Company...	Ellsworth, Pa.....	250
Pittsburgh-Buffalo Coal Company...	Washington County, Pa.....	250
Bessemer Coke Company.....	Millboro, Pa.....	150
Clare Coke Company.....	Pennsville, Pa.....	50
W. J. Rainey Coke Company.....	Brier Hill, Pa.....	1,300
Taylor Coal & Coke Company....	Searights, Pa.....	270
United Connellsville Coke Company...	Searights, Pa.....	50
W. A. Stone.....	Uniontown, Pa.....	100
Shenango Furnace Company.....	Wilpen, Pa.....	100

**Central Iron & Steel Company Handbook.**—In a flexible leather-bound book of 64 pages, 4½ x 6½ in., the Central Iron & Steel Company, Harrisburg, Pa., presents details of the one conspicuous line of which this company and its predecessors have made a specialty for nearly 54 years. The first plates were rolled at the original Harrisburg mill of the Central Iron Works in 1853, the annual output then being 1000 tons of charcoal iron plates. To-day the capacity is 150,000 tons of open hearth steel plates and the Central brand is in use in the important boiler shops, bridge works, locomotive works and shipyards of the country. The sizes of sheared and universal plates rolled at the four mills at Harrisburg are given, the range in width of sheared plates being from 24 to 120 in. The facilities of the flanging department are such as to take in heads from 12 to 120 in. Manufacturers' standard specifications are reproduced; also 25 pages of tables giving weights per lineal foot of flat rolled steel and weights of circular plates. A folded insert gives a plan view of the plant at Harrisburg.

The Pittsburgh Reduction Company, manufacturer of aluminum, Pittsburgh, Pa., has changed its name to the Aluminum Company of America. The company remains the same as regards its stockholders, its general business, its management and in every other way except in name.



## Canadian Shipbuilders Want a Bounty.

TORONTO, December 22, 1906.—In the new fiscal scheme that is now before the Dominion Parliament no provision is made for a bounty to assist the steel shipbuilding industry in Canada. This omission was disappointing to the companies engaged in the industry, and no less so to Halifax and Dartmouth, which have jointly been holding out inducements to establish a steel shipyard at some point on the common inlet where the operation of the plant would be advantageous to both towns. It is understood that the one condition required by certain parties who wish to build great works there is the granting of a Dominion subsidy. While the announcement of a bounty was looked for at the time the new tariff was published, the lack of a budget reference to shipbuilding is not taken as conclusive evidence that no bounty will be granted. To provide one, new legislation is necessary. It could not be dealt with either as a part of the tariff bill or as a detail of the Iron and Steel Bounties Act, the only measures affected by the budget announcements. The subject might very properly be reserved for separate treatment. At all events, interests concerned comfort themselves with the reflection that the silence of the Finance Minister on the subject does not necessarily mean that their petition is to be denied. But, all the same, after they had scanned the report of the budget speech in vain to find an intimation that something would be done for the industry they lost no time in renewing their endeavors to impress the Government with the need of a bounty.

A deputation at once waited on the ministers to urge afresh the considerations that had been submitted to the Government on the eve of the present session. Frederic Nicholls of the Canadian Shipbuilding Company, Toronto; Mr. Angstrom of the Bertram Company, Toronto; F. B. Polson of the Polson Company, Toronto, and Captain McDougall and Thomas Long of the Collingwood Shipbuilding Company, Collingwood, were present from Ontario. They were supported by representatives of the Nova Scotia interests. They asked a bounty of \$8 per gross ton. They were quite hopeful when they left the capital, and it would not be surprising if something were done the present session in behalf of shipbuilding. At present the shipbuilders have their material practically duty free, as they have had for years. Item 470 of the new tariff, word for word the same as item 542 of the old tariff, is as follows:

Iron or steel masts, or parts thereof, and iron or steel beams, angles, sheets, plates, knees and cable chain, for wooden, iron, steel or composite ships and vessels; and iron, steel or brass manufactures which at the time of their importation are of a class or kind not manufactured in Canada, when imported for use in the construction or equipment of ships or vessels, under regulations prescribed by the Minister of Customs—Free.

### A Memorial from the Maritime Interests.

The deputation from Toronto concurred in the statements made in a memorial that had been laid before the Government in the latter days of last month, just before the appearance of the budget, by the Halifax-Dartmouth interests. This memorial was signed by the mayor and the president of the Board of Trade in each of the two cities. In it reference is made to Canada's past prominence in shipbuilding. As recently as a generation ago there were 100 towns in the Maritime Provinces possessing yards for the building of wooden vessels. Canada was then one of the four great ship owning countries of the world. From this high place she began to fall as soon as steel commenced to displace timber as the framework of vessels. From fourth place, the country has fallen to the eleventh. In 1878 the registered tonnage was 1,333,015. In 1904 it had shrunk to 672,838. Of the 15,800,000 of its seagoing tonnage in and out, Canada can claim less than 2,000,000 tons, 3,500,000 tons going under the United States flag.

Of the Great Lakes traffic between Canada and the United States in 1904, the tonnage was about equally divided between Canadian owned vessels and American owned vessels. The inaccessibility of the lakes operates as a protection to Canadian vessels from the competition

of British builders. Canada's share of the tonnage on the lakes in 1904 was 7,975,487 tons, and the United States' share was 7,400,013. Since 1888 the increase there in favor of Canada's tonnage has been 83 per cent. In the coastwise trade, which with certain exceptions is limited to vessels of British and Canadian register, the astonishing increase of 35,000,000 tons has been made since 1876, the tonnage in that year being but 10,000,000. But this great increase in traffic has all gone to non-Canadian bottoms. In 1904 British vessels were credited with 42,938,396 of this coastwise tonnage, and foreign vessels with 2,566,726. The coasting trade of Canada is regulated by a statute which enacts that no goods or passengers can be carried from one port in Canada to another, except in ships flying the British flag. This has been modified by order in council admitting vessels of Italy, Germany, the Netherlands, Sweden, Norway, Austria, Hungary, Denmark, Belgium and the Argentine Republic to Canada's coastwise trade, in exchange for like privileges to British vessels in those countries.

### Steel Shipbuilding in Canada.

Canada has endeavored to accommodate itself in some measure to the change which the use of steel in shipbuilding called for. Yards have been established for building steel ships by the Algoma Iron & Steel Company at Sault Ste. Marie; the Canada Iron Furnace Company, Montreal; the Collingwood Shipbuilding Company, Collingwood; the Bertram Engine Works Company, Toronto; the Polson Iron Works, Toronto; the Canadian Shipbuilding Company, Toronto. The memorial proceeds to say:

While these yards are not closed, they are practically idle and serve to demonstrate the fact that under present conditions of competition with the British builders the industry cannot make any progress in Canada. The Imperial Merchants' Shipping Act being in operation in Canada, no tariff discrimination can be exercised in favor of our own shipping, such as is enjoyed by other industries, and therefore a bonus on the tonnage built seems the only practical method of assisting in the resuscitation of this business.

It is urged that the shipbuilding industry is as much entitled to protection as any manufacturing, a natural industry the Government fosters by duties or bounties. Without aid the Canadian shipbuilding industry cannot, it is represented, be saved from extinction. A policy that has been successful in building up the workshops and factories of Canada ought, it is argued, to be extended to the shipyards. It is maintained that there is no good reason why Canada should not build her own ships and do her own carrying trade.

C. A. C. J.

### Alabama Consolidated Company Changes.

J. H. Hoadley of New York has been elected president of the Alabama Consolidated Coal & Iron Company, to take effect on the first of the new year, when T. C. Bush retires from the presidency. Mr. Hoadley is president of the International Power Company, New York, and has large interests in the American Locomotive Company and other large corporations in the North. Mr. Hoadley has been largely interested in the Alabama Consolidated Coal & Iron Company for several years and has been vice-president of the company. He also has large personal interests in other Southern industrial properties. He intends to visit the Birmingham district early in the new year to inspect the various plants of the Alabama Consolidated, with a view of determining the future policy of development and expansion of the company. W. C. Seddon, a banker of Baltimore, and a brother of the late Thomas Seddon, who was at one time president of the Sloss-Sheffield Steel & Iron Company, has been elected a member of the Executive Committee, which vacancy was caused by the retirement of Mr. Bush. The committee is as follows: J. H. Hoadley, Richard H. Edmonds, editor of the *Manufacturers' Record*, and W. C. Seddon. M. W. Bush has been put in entire charge of the company's properties in Alabama, with headquarters at Birmingham. The company is negotiating for the services of one of the most experienced and most progressive furnacemen in the country, to have immediate charge of the operation of the furnaces. The general policy of the company will be the same as under the present management.

## OBITUARY.

**THEODORE HIERTZ**, president of the Theodore Hiertz Metal Company, St. Louis, died December 17. He was born at Vlanden, Luxembourg, January 23, 1831, and came to the United States in 1856. He was a pioneer in the erection of smelting furnaces in the West, and was also the founder of the business bearing his name. In July he retired from active business, having been incapacitated by a stroke of paralysis.

**SAMUEL T. BLEYER**, one of the organizers and until two years ago president of the Hawley Down Draft Furnace Company, Chicago, died December 18, aged 58 years. He was engaged in the machinery manufacturing trade in the West almost his entire business life. Upon his retirement two years ago he was succeeded as executive head of the company by his brother, Col. Charles E. Bleyer.

**JOHN S. SLAGLE**, one of the best known business men and a former iron and steel manufacturer of Pittsburgh, died at his residence in Allegheny, Pa., December 21. He was born in Washington, Pa., January 12, 1828. In 1855 he went to Pittsburgh, where he secured employment with the Schoenberger Iron Company, in which he became a partner in 1863. Later he became a member of Coleman, Rahm & Co., iron and steel manufacturers, and when that firm sold out to the Allegheny Valley Railroad Company he became a member of Nimick & Co., iron and steel brokers. This partnership was later dissolved, and Mr. Slagle conducted a similar business in his own name until his retirement two years ago. He is survived by his widow, one son and two daughters.

**EDWARD P. BULLARD, Sr.**, president of the Bullard Machine Tool Company, Bridgeport, Conn., and a well-known philanthropist, died in Braidentown, Fla., December 22, aged 65 years. He had been suffering from heart trouble for the past two years, which was the cause of death. Mr. Bullard left Bridgeport for the South December 19, accompanied by his wife. He leaves a widow, five sons and two daughters.

**JAMES THOMAS**, president of the Davies & Thomas Company, founder and machinist, Catasauqua, Pa., died December 18, aged 75 years. He was born in Philadelphia, and became a resident of Catasauqua in 1853. He was superintendent of the Carbon Iron Company, manufacturing pig iron, in 1859, and was general manager of the Irondale and the Eureka furnaces in Alabama in the early seventies. It is stated that he made the first coke pig iron produced in Alabama. In 1879 he engaged in the foundry business, assisting to form the Davies & Thomas Company, which has been very prominent in the manufacture of large castings for lining the New York tunnels now in course of completion. He was interested in a number of other local business enterprises.

**JOHN C. WALLACE**, one of the pioneer iron manufacturers of Pittsburgh, died December 23, after a long illness, aged 62 years. He was born in Londonderry, Ireland, and went to Pittsburgh when 17. For two or three years he was employed in dry goods stores. In 1865 he started for himself in a shoe business at Market street and Liberty avenue. In 1878, with John C. Kirkpatrick, he went into the iron business. They built a mill at Leechburg, Pa., where they manufactured sheet iron by a secret process. In 1882, under the name of Wallace, Banfield & Co., a tin plate mill was established by himself and associates at Irondale, Ohio. Both these plants were sold to the United States Steel Corporation in 1900, when Mr. Wallace retired from active business. For nine years he was a director in the National Bank of Western Pennsylvania.

**ROBERT VIERLING**, president of Vierling, McDowell & Co., Chicago, manufacturers of structural and ornamental iron and steel, died at his home in that city December 20. He was born in Buffalo, N. Y., in 1853, but received his early education in the Chicago public schools, and at an early age became engaged in the iron and steel business with the Union Iron Works. In 1881 he organized the company of which he was the executive head. He was also instrumental in the organization of the Paxton

& Vierling Iron Works, Omaha. A. J. Vierling, a brother, being the resident manager. He was a member of the Union League and Kenwood Clubs, and president of the Architectural Iron League, as well as a member of the Contractors' Council.

**SOLOMON FINLEY**, secretary and director for 47 years of the Howard Iron Works, Buffalo, N. Y., died December 17. He was born in that city in 1839 and retired from business six months ago.

**ADAM WEBER**, a widely known manufacturer of fire brick and fire clay gas retorts, died in New York City December 23, aged 81 years. He was born in Germany. His works were first located in New York, but the business has in late years been conducted by Adam Weber Sons, Weber, N. J. He founded the German Exchange and the Germania banks and was the founder and vice-president of the Union Square Bank. He was a member of the Liederkrantz, Arion, Lotos and Manhattan clubs and the American Gaslight Association and the Engineers' Club. He leaves a widow, two daughters and one son, Albert J. Weber, president of the corporation of Adam Weber Sons.

### The Du Bois Iron Works Extending Its Business.

The Du Bois Iron Works, Du Bois, Pa., capitalized at \$1,000,000, has taken over the entire business of the Lazier Engine Mfg. Company, Buffalo, N. Y. The company has been manufacturing for years gas and gasoline engines under the patents and designs of Arthur A. Lazier, formerly vice-president and general manager of the Lazier Engine Mfg. Company, who has sold out his entire interest and retires from the management of the latter company. Numerous improvements and changes will be made in the Du Bois engines, the name under which they will be sold, and they will be produced under the supervision of Peter Eyeremann of Germany, who is chief engineer of the engineering department. These engines can be operated on natural, illuminating and coke oven gas, gasoline, alcohol, distillate, crude oil and kerosene in sizes ranging from 5 to 300 hp. The company's line of simplex steam pumps will be continued. The headquarters and management will be located at Du Bois and a branch office will be retained at Buffalo, as well as in the principal cities throughout the country. John E. Du Bois is president; W. C. Pentz, vice-president; T. A. Badger, secretary and treasurer, and I. N. Hamilton, general manager. The sales and advertising departments will be under the management of C. E. Stuart.

The Joseph Dixon Crucible Company, Jersey City, N. J., although importing and handling all kinds of graphite, strongly advocates flake in preference to amorphous graphite, even though the latter in the finest grades is cheaper to produce. The reason given is that the flake graphite exists in the form of tough, thin flakes and combines only one ash or impurity (mica), itself not a bad lubricant, while amorphous graphite has clay as an impurity, which is not a lubricant and often causes the graphite to form into balls or paste in engine cylinders.

The Common Council of the city of Newark, N. J., decided last week to accept the United States Steel Corporation's offer to purchase a tract of land of 13½ acres on the Newark meadows. It was stated by the corporation's representative that while the land is to be used for a large warehouse for storage purposes some fabricating will be done there, and in all probability the trade will shortly hear of machinery requirements for the project.

The Treasury Department has issued regulations providing that on the exportation of electric traveling cranes manufactured by the Wellman-Seaver-Morgan Company, Cleveland, Ohio, with the use of imported electric motors forming a permanent part of the cranes, a drawback will be allowed equal in amount to the duties paid on the motors so used.

The Pennsylvania Railroad intends to buy 5000 freight cars.



## PERSONAL.

John Alexander, for many years representative on the Pacific Coast of the Rhode Island Perkins Horseshoe Company, Providence, R. I., has been elected superintendent and general manager.

J. C. Maben, president of the Sloss-Sheffield Steel & Iron Company, returned last week from a three months' sojourn in Europe.

W. E. Bassett, formerly connected with J. H. Day & Co., Cincinnati, has been appointed superintendent of the Aurora Tool Works Company, Aurora, Ill., to succeed Albert Weigel, resigned.

W. R. Warner and Ambrose Swasey of the Warner & Swasey Company, Cleveland, recently gave two evenings of lectures to their employees, presenting lantern slides of interesting places and public works visited in their more recent travels abroad. The audience numbered over 1000 employees and members of their families. Mr. Swasey lectured on his trip to Honolulu, Japan and the Philippines, and Mr. Warner presented views from the Nile, Palestine, Turkey and Greece.

Willard N. Sawyer, who has been general manager of the Lake Superior Corporation plant at Sault Ste. Marie, Ont., for the past two years, will become general manager of the Wellman-Seaver-Morgan Company, January 1. Mr. Sawyer was connected with the latter company before going to the Sault and had charge particularly of the construction of open hearth steel works.

Roy V. Myers, who has been chief engineer and superintendent of mines for the Dayton Coal & Iron Company, Ltd., Dayton, Tenn., and William Whaley, mechanical engineer for the LaFollette Coal, Iron & Railway Company, LaFollette, Tenn., have organized the engineering firm of Myers & Whaley. Their offices are in the Empire Building, Knoxville, Tenn.

John G. Brown, Witherspoon Building, Philadelphia, Pa., formerly general manager of the Unit Concrete Steel Frame Company, is now a consulting expert and contractor in concrete construction, and is ready to submit estimates either for specified concrete buildings or as alternates, where any other form of construction is called for.

George E. Emmons, general manager of the Schenectady, N. Y., works of the Edison General Electric Company, has been chosen chairman, and A. C. Stebbins vice-president of the Niles-Bement-Pond Company, Plainfield, N. J., vice-chairman, of the Second District Committee of the National Founders' Association.

H. M. Lane, who has been editor of *The Foundry* since October, 1903, will sever his connection January 1 with the Penton Publishing Company, to engage in the practice of consulting foundry engineering, with headquarters in Cleveland. Mr. Lane also expects to have New York connections, and will be in a position to advise on all classes of foundry construction and foundry metallurgy, including gray iron, steel and malleable. He will continue his position as secretary of the Foundry Supply Association for the present and will devote a much larger amount of his time to the work of the association than would be possible under the former arrangement. This will redound to the success of the convention of the American Foundrymen's Association in Philadelphia, May 20 to 24.

W. F. Brown, formerly of the E. P. Allis Company, Milwaukee, and afterward of the Brown Corliss Engine Company, Corliss, Wis., which latter company he organized, has entered the management of the Baldwin Chain & Mfg. Company, Worcester, Mass., manufacturer of chains, recoil checks and chain sprockets. Mr. Brown has been made president of the company, while W. H. Gates remains as treasurer.

The Muncie, Ind., Commercial Club proposes a plan to raise a factory fund by asking property owners to contribute to a Board of Trustees, appointed for the purpose, 2 per cent. of the valuation of their property. Negotiations are pending with several manufacturing concerns, but a larger cash account is needed by the club. The

Anderson Commercial Club, Anderson, Ind., has a similar plan.

## Navy Yard Improvements.

WASHINGTON, D. C., December 24, 1906.—The forthcoming report of Admiral Endicott, chief of the Bureau of Yards and Docks of the Navy Department, will contain some interesting information as to the progress that has been made the past year in consolidating the power plants of all the yards and naval stations in accordance with a plan adopted by the Secretary of the Navy. The report says:

"During the year a number of valuable improvements were completed and put in service, and some of the yards are nearing a state of satisfactory efficiency, so far as permanent improvements are concerned. However, at other yards, especially those recently established, a great deal remains to be done to make them of practical benefit to the service."

The chief of the Bureau of Yards and Docks estimates that \$11,474,118 will be required for the maintenance and improvement of the navy yards and naval stations during the next fiscal year. In this connection he says:

"The work toward the consolidation of heating, lighting and power plants should go rapidly forward in order that the saving which will result may be sooner realized.

"Additional dry docks are most urgently recommended. The navy afloat is further outgrowing the present and authorized facilities in this respect, and the need for docks which may be appropriated for at this time will undoubtedly be keenly felt by the time they could be completed. Estimates are submitted for beginning a large dock at Boston and one small and one large one at Norfolk. The mobility of floating dry docks has been thoroughly established, and the additional dock of that type for which an estimate is submitted will prove a valuable acquisition.

"The bureau renews its recommendation made in several previous reports, for consideration of the establishment of a docking station on the South Pacific Coast."

An estimate is submitted to provide for the commencement of the construction of a steel floating dry dock capable of taking up an injured vessel drawing 37 feet of water, which draft cannot now be accommodated by any dry dock in the United States. Such a dock would afford a very valuable addition to the naval establishment on the eastern coast. The docking facilities at Norfolk, which are not ample in an emergency, and are inaccessible to injured deep draft vessels drawing more than normal, would be relieved, and the service correspondingly benefited. It is believed that this dock could be completed in less than two years from date of contract, and would be capable of lifting a ship of 20,000 tons.

## Improvements Needed at New York Yard.

An estimate is submitted for an appropriation of \$538,000 for the improvement of the New York navy yard. In view of the importance of this yard this estimate is presented in some detail as follows:

Electric plant, extensions, \$25,000; heating system, extensions, \$20,000; underground conduits, extensions, \$15,000; railroad equipment, additional, \$5000; railroad system, extensions, \$10,000; electric motors for pump well valves, \$7000; sewers and drains, \$10,000; electric elevators, \$10,000; improvements to roofs of buildings, \$10,000; telephone system, extensions, \$12,000; central power plant, \$140,000; cement storehouse, \$11,000; coppersmith shop for steam engineering, \$97,000; storehouse for steam engineering (to cost \$102,000), \$51,000; ordnance storehouse (to cost \$146,000), \$50,000; brass foundry, \$25,000; additional story, building No. 31, \$40,000; total, \$538,000.

At this important navy yard it is essential that a large power plant be installed to meet the constant and heavy demands upon it. A very careful general plan was prepared and approved by the Department, and a portion of the necessary machinery has been contracted for. It is important that the balance of the plant be installed as early as possible, in order that the saving in maintenance and operation which will result from the elimination of independent plants may be secured.

The coppersmith shop of this department is now located in the foundry building, which is an exceedingly unsatisfactory and expensive arrangement. The engineer-in-chief urges the authorization of a new building to be devoted to coppersmith work.

An extension of the steam engineering brass foundry is greatly needed to provide facilities for meeting the increasing demands.

W. L. C.

## NEWS OF THE WORKS.

## Iron and Steel.

The syndicate headed by J. M. Barr, Norfolk, Va., formerly of the Seaboard Air Line, and J. B. Carrington, Birmingham, Ala., which recently acquired the properties of the Woodstock Iron Works at Anniston, Ala., has incorporated as the Woodstock Iron & Importation Company, with a capital stock of \$1,500,000, to place the property in operation. The property purchased includes two blast furnaces, 374 coke ovens, red and brown ore properties, a coal mine and limestone quarries. It is said to be the intention to get the smaller of its furnaces ready for blast at once, both of them having been out of blast since December, 1903. J. M. Barr is president and treasurer, J. B. Carrington, vice-president, and A. W. Wagner, secretary. H. T. Bardeleben is mentioned as manager of the blast furnaces and ore mines.

Gustave Benjamin of the Benjamin Iron & Steel Company, Buffalo, N. Y., who recently took over the Elmira Rolling Mill Company's plant at Elmira Heights, Elmira, N. Y., has incorporated the Federal Rolling Mill Company, with a capital stock of \$250,000, to operate the plant. The plant has been thoroughly overhauled for the rolling of refined merchant bar iron.

The Warwick Iron & Steel Company successfully blew in its No. 3 Furnace at Pottstown, Pa., the first cast being tapped December 16. The stack was formerly known as Anvil Furnace and had long been idle. The company is now running three stacks at Pottstown.

The Lewis Foundry & Machine Company, Pittsburgh, builder of rolling mill machinery, has secured a contract from the Seneca Iron & Steel Company, Buffalo, N. Y., for a new sheet mill plant to contain five hot mills, one roughing mill and three cold mills. The new plant is expected to be ready for operation about July or August of next year.

F. J. Lisman, 30 Broad street, New York, chairman of the preferred stockholders' committee of the Tidewater Steel Company, is offering the plant at Chester, Pa., for sale, owing to dissensions among stockholders. The stock is principally held by brokers and outside investors, not familiar with the steel manufacturing business, who are unwilling to supply sufficient working capital.

Furnace A of the Buffalo Union Furnace Company's group of three furnaces, Buffalo, N. Y., has gone out of blast for repairs.

The Cherry Valley Iron Company, which owns a large blast furnace at West Middlesex, Pa., is considering the erection of a steel mill to work up its pig iron. The Borough Council, recognizing this as a proposal that should be encouraged, proposes to give the steel plant free taxes for 10 years and not to raise the taxes on the blast furnace for the same period. As the town has splendid railroad facilities and plenty of water it seems entirely likely that the company will go on with the steel plant.

C. J. Kirk and other New Castle, Pa., capitalists are interested in securing the erection of a large rolling mill at that place.

The Thomas Iron Company has blown in its No. 3 Furnace at Hokendauqua, Pa., after an idleness of several weeks for relining.

The Maryland Steel Company has started a number of the coke ovens at the Tidewater plant at Chester, Pa. It is expected to put the Tidewater Furnace into operation before many weeks.

Hall Furnace of the Republic Iron & Steel Company, at Sharon, Pa., which has been closed down for some months for extensive repairs, has practically been rebuilt and was put in blast last week. The furnace is now in splendid condition and will have an output of 350 to 400 tons of Bessemer iron per day.

The Allegheny Steel Company, Pittsburgh, works at Avenue, Pa., is building a fourth open hearth furnace of 50 tons capacity. The company's plant contains seven sheet mills and a three-high plate mill with tables, the latter having been changed to allow it to roll heavier plates. The company makes all the steel needed for its own finishing mills, and in addition supplies steel to the Interstate Steel Company, an identified interest, which has about completed the building of two more sheet mills, giving it a total of six.

Some extensive improvements are to be made at the Scott-dale, Pa., works of the American Sheet & Tin Plate Company. These include a new galvanizing department, consisting of two steel buildings to be equipped with 15-ton traveling cranes. The buildings will also contain six galvanizing pots and riggings. A new steel hot mill building equipped with a 30-ton electric traveling crane will also be erected. A new steel annealing building will be added which will contain six double annealing furnaces, transfer tracks, &c., with a 30-ton electric traveling crane. It is expected that these buildings will be preliminary to a complete reconstruction of the mills and machinery, the plan involving the final development of the plant to a capacity of 24 hot mills and 10 galvanizing pots.

## General Machinery.

John M. Larsen has retired from the presidency of the Larsen Baker Ice Machine Company, Omaha, Neb., manufacturer of the

ice making and refrigerating machinery, and, pursuant to arrangements with this company, he has organized a selling company to market its products in the territory lying east of the Missouri River. This selling company has been organized under the name of the Larsen Ice Machine Company, of which John M. Larsen is president, and offices have been established at 315 Dearborn street, Chicago.

The W. G. King Company has been incorporated at Buffalo, N. Y., with a capital stock of \$100,000, to manufacture machinery, special machine tools and mechanical devices. The company has leased factory space which it will equip at once.

The Street Bros. Machine Company, whose plant is located at 521 Broad street, Chattanooga, Tenn., is arranging to enlarge its capacity. It has purchased a site at Orange Grove, a suburb of the city, and will erect a modern and well equipped machine shop.

The Stevenson Machine Company has been incorporated at Buffalo, N. Y., with a capital of \$100,000, to manufacture a newly patented routing machine for woodworking purposes and special tools. Factory premises have been secured and will be equipped with the necessary machinery. The incorporators are C. P. Stevenson, L. G. Kelley and A. Baker, Buffalo.

The Illinois Central Railroad will enlarge its machine and repair shops at McComb City, Miss. A 30-stall roundhouse will be put in to accommodate 30 additional engines.

The United Iron Works, Iola, Kan., has secured a contract for \$45,000 worth of machinery for the Hunt Engineering Company of that city. This is in addition to a \$20,000 contract closed some time ago.

## Power Plant Equipment.

The Snider-Hughes Company, Cleveland, and the Canton Pump Company, Canton, Ohio, have consolidated, and the Canton-Hughes Pump Company has been incorporated with a capital stock of \$150,000 to carry on the business of the merged interests. The Cleveland plant has been moved to Canton and combined with the plant there, where the new company now has a complete equipment of modern machinery and will be able to place on the market the complete lines of duplex and single pumps formerly made by the two companies. Excellent shipping facilities are provided by the Pennsylvania, Baltimore & Ohio and Wabash railroads. W. H. Whiting is president, W. H. Hughes vice-president and superintendent, and F. O. Hamilton secretary and treasurer.

The Davis Mfg. Company, Milwaukee, Wis., manufacturer of automobile gas engines, has leased the plant of F. Bogenberger & Brother, at 267 Sixth street, for a term of years and will move to the new quarters in January.

The Midland Condenser Company, recently incorporated at Buffalo, N. Y., with a capital stock of \$500,000 to engage in the manufacture of feed water heaters and surface condensers, under patents owned by it, also other steam specialties of various kinds, has purchased an extensive site for a plant on Elmwood avenue, having track connections with the Erie and the Lackawanna railroads, and will at once commence the erection of its factory buildings. They will consist of an erecting and machine shop, 100 x 250 ft.; warehouse, power house and office building. The plant will be fully equipped with the latest improved machine tools.

Application has been made at Harrisburg, Pa., for a State charter for the Kensington Engine Works, Philadelphia. The new company will manufacture engines and machinery and also construct and install manufacturing plants. William C. Francis, G. D. Van Selver and Wm. H. Guppy, all of Philadelphia, are the incorporators.

James Bonar & Co., Incorporated, Pittsburgh, have orders for 13 complete automatic continuous oiling systems to install. These include three systems for the Duquesne Steel Works of the Carnegie Steel Company, one for the Jones & Laughlin Steel Company and one for the Pittsburgh & Butler Street Railway at Renfrew, Pa. This firm has recently issued an interesting catalogue on oil filtration.

## Foundries.

The Standard Foundry & Steel Casting Company will erect a plant at Jeannette, Pa., and is taking bids for the erection of a steel and corrugated building to contain the plant.

The Wetherill Finished Castings Company has been formed at Philadelphia, Pa., by S. P. Wetherill, J. P. Wetherill and S. P. Wetherill, Jr. It will manufacture various kinds of castings under processes controlled by the owners.

The Seaboard Steel Casting Company, Chester, Pa., has been making some unusually large castings lately. Recently a 40,000-lb. sternpost was cast at the plant for the steamer Minnesota.

The Standard Foundry & Mfg. Company, De Kalb, Ill., has been incorporated with a capital of \$30,000 to operate a gray iron jobbing foundry. Operations will be commenced about the first of the year. The incorporators are S. M. Hunt, A. M. Wheeler and R. D. Hunt.

At a special meeting of the stockholders of the Lynchburg Foundry Company, Lynchburg, Va., held December 18, it was decided to increase the capital stock of the company to provide additional facilities for handling the enormous increase in business in each department, and authority will be asked of the



State Corporation Commission to make the authorized capital of the company \$500,000, of which \$300,000 will be common stock and \$200,000 preferred stock. The present paid-up capital of the company is \$350,000, and it owns and operates the McWane Pipe Works, the Radford (Va.) Pipe Works and the Lynchburg Plow Works. Less than five years ago this company had a capital of only \$80,000 and employed but 60 men. Now it has more than 500 men on its payroll and is doing a business close to \$1,250,000 per annum. In the pipe department alone the production has been increased during the past four years from 12 to 150 tons per day.

The Blaisdell Machinery Company, Bradford, Pa., is erecting a new foundry 80 x 100 ft. The company is also putting up a pattern storage building 40 x 50 ft.

The Lonsdale Foundry Company, Knoxville, Tenn., has been incorporated with a capital stock of \$25,000. The incorporators are J. T. Ammons, J. W. Tillery, M. A. Ammons, W. P. Richards, A. T. Richards, P. E. Tillery and J. M. Brooks.

#### Bridges and Buildings.

The Niagara Frontier Bridge Company, recently incorporated in the State of New York for the purpose of constructing a bridge spanning the Niagara gorge at Devil's Hole, just below the Whirlpool, has applied for a Canadian charter and will begin construction work as soon as it has been granted and permit is secured for the Canadian approach.

#### Fires.

One of the large buildings of the plant of the Newport News Shipbuilding & Dry Dock Company, Newport News, Va., was burned December 25, the loss being estimated at over \$100,000.

The plant of the Georgia Mfg. & Public Service Company, Marietta, Ga., which supplies that city with water and electricity, was badly damaged, and the Marietta paper mill, operated by the company, was practically destroyed by fire December 24. The total loss is placed at \$150,000.

The leather factory of F. C. Parker & Son, Woburn, Mass., was damaged \$30,000 by fire December 17.

The stone crushing plant of Lauer Bros., Minneapolis, Minn., was burned December 10. The loss on machinery is placed at \$15,000.

The boiler shop of the Canadian Northern Railroad, at Fort William, Ont., was recently burned, the loss being about \$10,000.

#### Hardware.

The Cleveland Stamping & Tool Company, Cleveland, Ohio, reports that November was the biggest month for business in the company's history. The company has increased the capacity of its plant 25 per cent. the past year.

The Columbian Hardware Company, Cleveland, Ohio, is rushed with heavy orders for screen door hardware. A good demand for its other products is also noted. The company has recently installed some automatic machinery for wire goods and has increased the capacity of its plant 30 per cent. the past year.

The Automatic Yoke Company, Indianapolis, Ind., has leased the plant of the Braughton Mantel Company, North Memphis, Tenn., and is operating it for the manufacture of its line of yokes.

The Indiana Picker & Husker Company has been incorporated at Lafayette, Ind., with \$50,000 capital stock. The directors are Richard Carpenter, Bert J. Krull, Adam Wallace, Harry L. Steel and Adam O. Behm.

The Sidney Steel Scraper Company, Sidney, Ohio, manufacturer of Haslup's patent scrapers, barrows, trucks and plows, is now building and expects to have ready early in 1907 a new plant with 50 per cent. greater manufacturing capacity than the old. The marked increase, in its export trade especially, has compelled the company thus to enlarge its facilities.

Abingdon Trap Company, Abingdon, Ill., has during the fall relieved its cramped quarters by the addition of about 5000 sq. ft. of floor space, which has enabled the company to increase its product and turn out goods much more advantageously than heretofore. A number of new machines have been installed, but the growing demand for the company's traps has kept the plant running to full capacity and some of the time has even necessitated working a night shift. In addition to the Ell trap originally placed on the market the company is now making several other popular lines.

James Pender & Co., Limited, St. John, N. B., has during the year added fencing staples and smaller staples to the line formerly manufactured, comprising annealed wire for hay baling, tinman's wire, wire in cut lengths of various sizes and kinds, wire nails, horse nails and toe calks. The company has also added a galvanizing plant for jobbing work as well as for galvanizing nails, and has increased its capacity in toe calks to double what it was last year. A new process for making horse nails with a chisel point has also just been completed.

The Berger Mfg. Company, Canton, Ohio, has just about completed the buildings for its additional mills, comprising the plant of the Waukesha Sheet Steel Company. The five hot mills and bar mills, with necessary furnaces, will be installed and ready to operate in less than 30 days. The company is also

preparing to erect a new galvanizing department building, 75 x 375 ft., containing five galvanizing machines. The space now being used as a galvanizing department will be utilized for increasing the company's facilities for turning out roofing, as its trade has outgrown the productive capacity of the present roofing department. Other improvements are contemplated but will not be carried out until after those mentioned above are completed.

The H. C. Cook Company, Ansonia, Conn., manufactures a line of metal novelties, making a specialty of the Gem nail clipper. Its plant is especially well equipped for the production of light machinery, dies, punches, models, &c., including nickel plating. H. C. Cook is president, Lewis I. Cook treasurer, and Chapel S. Carter secretary.

The Uwanta Wrench Company, Meadville, Pa., owing to the increased demand for its product, is erecting a new building of concrete, 32 x 150 ft. in dimensions. Machinery of the latest and most improved type is being installed. The company makes the Uwanta wrench in all the usual sizes, and reports an excellent domestic demand as well as some foreign orders.

The Consolidated Sheet Metal Works, Milwaukee, Wis., has been incorporated, with a capital stock of \$50,000, and on January 1 will occupy a new factory which has been erected at 661-673 Hubbard street. The new company is a consolidation of several prominent sheet metal manufacturers of Milwaukee. The incorporators are John and Fred Bogenberger, who have constituted the firm of F. Bogenberger & Brother, 267 Sixth street; Paul L. Biersach, who has been a member of the firm of Biersach & Niedermeyer Company, 220 Fifth street, and William Hammann, who has for several years conducted a plant at 752 Fourth street. The new building to be occupied by the company is 100 x 150 ft., one story and basement, of fireproof construction. Much of the machinery from the old plant of F. Bogenberger & Bro. will be removed to the new factory, and large orders have been placed for machinery with George Ohl & Co., Newark, N. J. Upon the installation of the new machinery the company will be prepared to turn out work in 24 hours that heretofore has consumed from four to five days.

#### Miscellaneous.

The Abrasive Material Company, Philadelphia, Pa., is shipping wheels to all parts of the world, including England, Germany, Austria, Japan and Siberia, and has lately received orders from Italy amounting to between 700 and 800 wheels of various sizes, the total weight of which is between four and five tons.

The International Brick Machine Company, recently incorporated, has its offices in the Phelps Bank Building, Binghamton, N. Y. G. C. Bayless is president, A. J. Parsons vice-president, and F. J. Bayless secretary and treasurer.

The Henes & Keller Company, manufacturer of bottling machinery, has moved its plant from Milwaukee, Wis., to Menominee, Mich., where it will occupy a new factory recently erected. The machinery from the Milwaukee plant has been moved to Menominee and operations were commenced in a small way on Monday, December 17.

The Frontier Gas Meter & Appliance Company has been incorporated at Niagara Falls, N. Y., with a capital stock of \$25,000, to manufacture gas meters, fixtures, &c. G. M. Tuttle and R. L. Rice, Niagara Falls, and J. Seymour, Buffalo, are the incorporators.

The Blennerhassett Gaslight Company has been incorporated at Buffalo, N. Y., to manufacture gas stoves and gas and electric appliances. The incorporators are W. Brown, C. W. Whitsell and W. L. McConnell.

The Niles Corrugating Company, Niles, Ohio, now has its new galvanizing department in operation. The new buildings are 60 x 300 ft. and contain two galvanizing pots, having an output of 250 tons of galvanized sheets per week.

The Pittsburgh Subway Company, seeking a franchise to run underground trains through the city of Pittsburgh, contemplates using all steel cars, according to E. K. Morse, the chief engineer. The company is also desirous of operating a pneumatic tube between the downtown post office and the East End post office for carrying mail.

The American Electrical Supply Company, Chicago, jobbers of electrical equipment and supplies, has increased its capital from \$50,000 to \$100,000 and the number of directors from five to nine. No additions will be made to the warehouse facilities, inasmuch as the increase was made to provide additional funds for the extension of its business.

In the United States Circuit Court at Boston, on December 22, William H. Ellis, a contractor, was fined \$500 for violating the Federal eight-hour law in employing men in the construction of a pier at Charlestown Navy Yard. The case will be taken to the Supreme Court, the defense contending that the law is unconstitutional.

The Shenango Furnace Company, Pittsburgh, which operates four blast furnaces at Sharpsville, Pa., gave its employees an extra day's pay as a Christmas gift.

## The Iron and Metal Trades

Buying for the second half of 1907 on the part of consumers of Pig Iron has developed in increasing volume in the Eastern markets, and is becoming a feature, too, in the Central West. In the East it has been taken up by nearly all classes of melters, and appears to be confined largely to the covering of work already in hand. Conspicuous among the purchasers are again the Open Hearth Steel producers. One tidewater plant has taken an aggregate of 31,000 tons of Basic Pig, nearly all for the second half, at prices ranging from \$22 to \$23.25 at furnace. It is understood that further business is pending. Another works in New York State has taken about 15,000 tons, partly for summer delivery and partly for the second half at even better prices. Locomotive works have purchased an aggregate of about 20,000 tons, also for the second half, while a Western agricultural implement maker is making inquiries for a round lot of Foreign Foundry Iron for April shipment.

Some Buffalo furnace interests have followed the example of the Southern producers in opening their books for the second half at a considerably lower price than that prevailing for earlier deliveries. Thus important Birmingham interests quote \$22 for the first quarter, \$21 for the second quarter, \$18.50 to \$19 for the third quarter and \$18 to \$18.50 for the second half.

That consumers should be willing to contract for delivery so far ahead, at prices which would have seemed extravagant six months ago, is a surprising proof of confidence in the future, and in some branches seems hardly in harmony with the outlook for values in finished material which powerful interests are striving to hold at old levels.

An event of more than passing interest is the reappearance in the market of the Bethlehem Steel Company as a seller of Steel Rails. For many years the Rails of this company stood first in quality, and it was an important factor in the industry. Then it disappeared entirely as a maker. Now the plant under construction will make a specialty of Special Rails, and will produce Open Hearth Steel Rails exclusively. The company has just effected a sale of 22,500 tons to the Oregon & Washington road, of the Harriman system, for delivery after the middle of the year. Among other sales we note 4000 tons to the Iowa Central and 5500 tons to the Bangor Railway. Light Rails have been advanced in price to \$33, base, Pittsburgh.

Only smaller contracts for Bridge work and Structural Material have been placed, although some good work is coming in, and specifications are flowing in to the mills at a satisfactory rate. The American Bridge Company will probably fabricate a little over 600,000 tons this year, while its orders sum up over 700,000 tons. An interesting recent order is for 3700 tons of Riveted Pipe for the Telluride Power Company.

After a series of advances the makers of Pipe have finally, last week, restored the level of prices which ruled in April, 1905. This last advance amounts to \$2 per ton on Merchant Pipe, \$4 per ton on Boiler Tubes and a like amount on Oil country goods. There is an inquiry in the market for 285 miles of 8-in. Pipe for California.

The demand for Bars continues heavy from all sources. In Sheets and Tin Plate an advance is believed imminent. In the Wire trade the question of being able to accumulate some stock for spring requirements is troubling the mills, in view of the steady demand for prompt shipments. The problem really is whether the trade has changed and is not so much subject to a spring rush as in the past.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,  
Declines in Italics.

At date, one week, one month and one year previous.

Dec. 26, Dec. 19, Nov. 28, Dec. 27,  
1906. 1906. 1906. 1905.

### PIG IRON, Per Gross Ton:

Foundry No. 2, Standard, Philadelphia .....	\$25.00	\$24.50	\$24.00	\$18.25
Foundry No. 2, Southern, Cincinnati .....	26.00	25.00	25.00	16.75
Foundry No. 2, Local, Chicago .....	25.50	25.50	25.50	19.25
Bessemer, Pittsburgh .....	23.35	23.85	23.35	18.35
Gray Forge, Pittsburgh .....	22.85	22.85	22.85	16.85
Lake Superior Charcoal, Chicago .....	26.00	26.00	26.00	20.00

### BILLETS, &c., Per Gross Ton:

Bessemer Billets, Pittsburgh ..	29.50	29.50	29.50	26.00
Forging Billets, Pittsburgh ..	36.50	36.50	36.50	30.00
Open Hearth Billets, Phila. ....	34.00	34.00	33.00	30.00
Wire Rods, Pittsburgh .....	37.00	37.00	37.00	32.50
Steel Rails, Heavy, Eastern Mill ..	28.00	28.00	28.00	28.00

### OLD MATERIAL, Per Gross Ton:

O. Steel Rails, Chicago .....	18.50	20.50	20.50	16.50
O. Steel Rails, Philadelphia .....	20.00	20.00	20.00	18.25
O. Iron Rails, Chicago .....	28.00	28.00	28.00	23.00
O. Iron Rails, Philadelphia .....	27.75	27.75	27.50	24.50
O. Car Wheels, Chicago .....	25.25	25.25	24.00	19.00
O. Car Wheels, Philadelphia .....	23.00	23.00	23.00	18.75
Heavy Steel Scrap, Pittsburgh ..	20.00	20.00	20.00	17.50
Heavy Steel Scrap, Chicago .....	17.00	17.50	17.50	15.00

### FINISHED IRON AND STEEL,

Per Pound:

	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia ..	1.83½	1.83½	1.83½	1.83½
Common Iron Bars, Chicago .....	1.81½	1.76½	1.71½	1.85
Common Iron Bars, Pittsburgh ..	1.80	1.80	1.80	1.90
Steel Bars, Tidewater, New York ..	1.74½	1.74½	1.74½	1.64½
Steel Bars, Pittsburgh .....	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York ..	1.84½	1.84½	1.84½	1.74½
Tank Plates, Pittsburgh .....	1.70	1.70	1.70	1.60
Beams, Tidewater, New York ..	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh .....	1.70	1.70	1.70	1.70
Angles, Tidewater, New York ..	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh .....	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh ..	1.65	1.65	1.65	1.55
Skelp, Sheared Steel, Pittsburgh ..	1.70	1.70	1.70	1.65

### SHEETS, NAILS AND WIRE,

Per Pound:

	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh .....	2.50	2.50	2.50	2.20
Wire Nails, Pittsburgh .....	2.00	2.00	1.90	1.80
Cut Nails, Pittsburgh .....	2.05	2.05	1.95	1.75
Barb Wire, Galv., Pittsburgh .....	2.45	2.45	2.35	2.25

### METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York .....	23.50	23.00	22.75	19.00
Spelter, St. Louis .....	6.55	6.55	6.30	6.50
Lead, New York .....	6.30	6.30	6.00	5.95
Lead, St. Louis .....	6.05	6.15	5.87½	5.80
Tin, New York .....	42.80	42.37½	43.40	35.90
Antimony, Hallett, New York ..	25.00	25.00	25.00	13.00
Nickel, New York .....	45.00	45.00	45.00	40.00
Tin Plate, Domestic, Bessemer, 100 lb., New York .....	\$4.00	\$4.00	\$4.00	\$3.50

## Chicago.

FISHER BUILDING, December 24, 1906.

With the advent of inclement weather transportation facilities are becoming more involved, and the congestion at the mills, owing to the rapidly accumulating tonnage, occasions considerable alarm. In the South the car shortage shows no improvement, as the daily allotment provided the furnaces is declining rather than increasing, rolling stock still being tied up in the movement of the cotton crop. Shipments of Coke from the Pocahontas field have ceased almost entirely, and many operations have been compelled to shut down temporarily, as the car supply is inadequate to move the production. The large By-Product Coke capacity in this district to a large extent overcomes the shortage of the supply from the other fields, and while no furnaces are in danger of banking, nevertheless the stocks on hand are not sufficient to tide them over in case shipments are unduly delayed. Following the initiative of the Southern roads, lines north of the Ohio River have decided on a 20c. advance on Pig Iron, effective February 1, making the total increase from the Birmingham District 45c. a ton. At the same time the tariff from Virginia stacks will be increased 25c., to \$3.10. These advances will all be borne by the consumers, shippers having carefully covered this point in contracts now in force. Considerable inquiry has developed for second and third quarter shipments, one implement maker asking for prices on 3000 tons. The buying movement, however, has not yet reached the proportions of that under way in the East, although it is expected immediately after the



first of the year. Eastern mills are asking as high as 1.90c. to 2c., Pittsburgh, for both Sheared and Universal Plates for early delivery, while the Western manufacturers are not in position to make shipment in less than three or four months. Specifications for Structural Shapes continue to increase in volume, although new operations projected are of little importance. Another advance of \$2 a ton was made on Merchant Pipe on December 20, and at the same time Boiler Tubes were marked up two points, equivalent to \$4 a ton. During the week the American Bridge Company booked an order for 3700 tons of Riveted Pipe for the Telluride Power Company, to be laid in Utah and Montana, and numerous small orders for buildings, aggregating 1000 tons, were also taken. An order for 4000 tons of Rails booked by the Illinois Steel Company was transferred to the Carnegie Steel Company.

**Pig Iron.**—Effective February 1, freight rates from the Birmingham District, owing to the 20 cent advance announced by the roads north of the Ohio River, and 25 cents south, will be increased 45 cents a ton, making the haul to Chicago \$4.35, as compared with \$3.90, the present rate. From Virginia furnaces the rate will be \$3.10, as compared with \$2.85. Inquiry for future requirements is heavy, and the heavy buying in the East is reflected in the advances made by Southern interests. For January delivery \$23, Birmingham, is asked for No. 2, and for the remainder of the first quarter \$22 is the minimum. For the second quarter \$21 is the best that can be done on standard grades, and for July, August and September prices range from \$18.50 to \$19. Virginia producers have established a basis of \$23 for the first half, \$22 for the last six months, and \$21 for shipments spread over the entire year, nor will any sales be made for less than six months' periods. Quotations of Northern operators for the third quarter range from \$22.50 to \$23 for Malleable Bessemer and No. 2 Foundry, delivered Chicago, and are considerably lower than those made by shippers from the Birmingham and Virginia districts. This spread will, however, not obtain for any considerable period, as the minimum asked for Charcoal grades over the first half is \$25.50, f.o.b. Chicago, and for prompt delivery \$26.50 to \$27 is quoted. The car shortage in the South is becoming more acute and heavy stocks are being accumulated in furnace yards. A Coke shortage threatens to curtail production in this vicinity, although the by-product ovens in this city and Milwaukee will lessen the effect of a curtailed supply from the important fields. Quotations for March and April shipments, f.o.b. Chicago, including the 45c. advance in freight rates on Southern grades, are as follows:

Lake Superior Charcoal.....	\$26.00 to \$26.50
Northern Coke Foundry, No. 1.....	26.00 to 26.50
Northern Coke Foundry, No. 2.....	25.50 to 26.00
Northern Coke Foundry, No. 3.....	25.50 to 26.00
Northern Scotch, No. 1.....	26.00 to 27.00
Ohio Strong Softeners, No. 1.....	26.00 to 26.50
Ohio Strong Softeners, No. 2.....	25.50 to 26.00
Southern Coke, No. 1.....	26.85 to 27.35
Southern Coke, No. 2.....	26.85 to 26.85
Southern Coke, No. 3.....	25.85 to 26.35
Southern Coke, No. 4.....	25.35 to 25.85
Southern Coke, No. 1 Soft.....	26.85 to 27.35
Southern Coke, No. 2 Soft.....	26.35 to 26.85
Southern Gray Forge.....	25.35 to 25.85
Southern Mottled.....	22.85 to 23.35
Malleable Bessemer.....	26.00 to 26.50
Standard Bessemer.....	25.50 to 25.80
Jackson Co. and Kentucky Silvery, 6 %	27.30 to 27.80
Jackson Co. and Kentucky Silvery, 8 %	29.30 to 29.80
Jackson Co. and Kentucky Silvery, 10 %	31.30 to 31.80

**Metals.**—The supply of Copper continues inadequate to the demand and prices continue to advance. Sheet Copper, Bottoms and Pipe have been marked up 2c. per lb. as a result of the recent advances in raw material. We revise quotations as follows: Casting Copper, 25c. to 25½c.; Lake, 25½c. to 25¾c., in car lots for prompt shipment; small lots, ¼c. to ¾c. higher; Pig Tin, car lots, 45½c.; small lots, 45¾c.; Lead, Desilverized, 6.50c. to 6.60c., for 50-ton lots; Corroding, 7.25c. to 7.35c., for 50-ton lots; on car lots, 2¼c. per 100 lb. higher; Spelter, 6.75c.; Cookson's Antimony, 28¾c., and other grades, 26¾c. to 27¾c.; Sheet Zinc is \$8.25 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 19½c.; Heavy Copper, 19¼c.; Copper Bottoms, 18½c.; Copper Clips, 19c.; Red Brass, 18½c.; Red Brass Borings, 15½c.; Yellow Brass, 15c.; Yellow Brass Borings, 13½c.; Light Brass, 11½c.; Lead Pipe, 5.50c.; Tea Lead, 5c.; Zinc, 5c.; Pewter, No. 1, 28c.; Tin Foil, 34c.; Block Tin Pipe, 27¾c.

**Billets and Rods.**—Eastern mills are now offering Forging Billets in this market, and we note the sale of 1500 tons at \$38, Chicago. The supply of Rods for immediate needs is limited, and small lots are selling on the basis of \$40, Chicago.

**Rails and Track Supplies.**—New tonnage in Standard Sections is light, the largest order of the week having been booked by the Illinois Steel Company, amounting to 4000 tons. The tonnage that will be carried over by the company's South Works will be considerable, but will not be as large as last year. We quote: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c.; Spikes,

2.25c. to 2.50c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$33; 25-lb., \$34; 20-lb., \$33; 16-lb., \$36; 12-lb. \$37, f.o.b. mill. Standard Sections, \$28, f.o.b. mill, full freight to destination.

**Structural Material.**—Contracts for the Halsted Street Bridge and the power house of the Chicago & Milwaukee Electric road remain unplaced, and the small orders booked by the American Bridge Company only aggregate 1000 tons. The mills report an increase in the volume of specifications, and shipments on new orders are now deferred 30 days. Material from stock is unchanged at 2.05c. to 2.10c., and mill quotations are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

**Plates.**—Several Eastern mills have advanced prices to 1.90c. and 2c., Pittsburgh, and shipments to meet prompt requirements are hard to secure, notwithstanding the recent advances. Among the large orders booked recently is one for 3700 tons of Riveted Pipe, taken by the American Bridge Company for the Telluride Power Company. Quotations are unchanged, as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.76½c. to 1.86½c.; 3-16 in., 1.86½c. to 1.96½c.; Nos. 7 and 8 gauge, 1.91½c. to 2.01½c.; No. 9, 2.01½c. to 2.11½c.; Flange quality, in widths up to 100 in., 1.86½c. to 1.96½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.86½c. to 1.96½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in., up to 60 in. wide, 2.10c. to 2.20c.; 72 in. wide, 2.35c. to 2.45c.; No. 8 up to 60 in. wide, 2.15c. to 2.25c.; Flange and Head quality, 0.25c. extra.

**Bars.**—The Iron Bar market has developed increased strength, despite the weakening of mill grades of Scrap, and the minimum for forward shipments to Western points is 1.65c., Pittsburgh, while as high as 2.01½c., Chicago, has been secured on small lots for prompt delivery. Steel Bar specifications are of large volume, and the accumulated tonnage on mill order books covers four months' output. We quote: Iron Bars, 1.81½c. to 1.86½c.; Steel Bars, 1.76½c., both half extras; Hoops, 2.16½c., extras as per Hoop card; Bands, 1.76½c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

**Sheets.**—The advent of the year end inventory period has not affected the demand for Sheets to any appreciable extent, and considerable tonnage for early shipment continues to be offered the mills. Premiums of \$1 a ton prevail on the heavier gauges, and an early advance throughout the list is anticipated. Quotations are unchanged, as follows: Blue Annealed, No. 10, 1.96½c., No. 12, 2.01½c.; No. 14, 2.06½c.; No. 16, 2.16½c.; Box Annealed, Nos. 17 to 21, 2.51½c.; Nos. 22 to 24, 2.56½c.; Nos. 25 and 26, 2.61½c.; No. 27, 2.66½c.; No. 28, 2.76½c.; No. 29, 2.86½c.; No. 30, 2.96½c.; Galvanized Sheets, Nos. 10 to 14, 2.71½c.; Nos. 15 and 16, 2.91½c.; Nos. 17 to 21, 3.06½c.; Nos. 22 to 24, 3.21½c.; Nos. 25 and 26, 3.41½c.; No. 27, 3.61½c.; No. 28, 3.81½c.; No. 30, 4.31½c. Sheets from store, Blue Annealed, No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store, Nos. 10 to 20, 3.20c. to 3.25c.; Nos. 22 to 24, 3.45c. to 3.50c.; No. 26, 3.55c. to 3.60c.; No. 27, 3.65c. to 3.85c.; No. 28, 4c.; No. 30, 4.55c. to 4.60c.

**Merchant Steel.**—So far as new tonnage is concerned the market is quiet although specifications from implement makers are unprofitably heavy and shipments are deferred. Quotations are unchanged, as follows: Planished or Smooth Finished Tire Steel, 1.96½c.; Iron Finish, up to 1½ x ½ in., 1.91½c.; Iron Finish, 1½ x ½ in. and larger, 1.76½c., base; Channels for solid rubber Tires, ¾ to 1 in., 2.26½c., and 1½ in. and larger, 2.16½c.; Smooth Finished Machinery Steel, 2.01½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 2.06½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.31½c.; Railroad Spring, 1.96½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, in base territory.

**Merchant Pipe.**—Effective December 20, Steel Pipe was advanced one point, equivalent to \$2 a ton, the abnormal demand and high cost of raw material being the contributing factors to this upward movement. Discounts on car lots, Chicago, are as follows: Black Steel Pipe, 75.35 on the base sizes, ¾ to 6 in., and Galvanized, 65.35. From store in small lots Chicago jobbers quote 72½ to 73 per cent. on Black

Steel Pipe,  $\frac{3}{4}$  to 6 in. Iron Pipe is held at an advance of four to five points above these prices.

**Boiler Tubes.**—An advance of two points, equivalent to \$4 a ton, was announced December 20, by the National Tube Company, and is the first that has been made since Merchant Pipe began its upward movement. Specifications are reputed heavy, the requirements of locomotive manufacturers being unparalleled in the history of the trade. Mill quotations are as follows on the base sizes,  $2\frac{1}{4}$  to 5-in., in carload lots: Steel Tubes, 66.35; Iron, 53.35; Seamless, 50.35;  $2\frac{1}{2}$ -in. and smaller, and lengths over 18 ft., and  $2\frac{1}{4}$ -in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are however unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to $1\frac{1}{4}$ in. ....	40	35	42 $\frac{1}{2}$
$1\frac{1}{4}$ to $2\frac{1}{4}$ in. ....	50	35	35
$2\frac{1}{4}$ in. ....	52 $\frac{1}{2}$	35	30
$2\frac{1}{2}$ to 5 in. ....	60	47 $\frac{1}{2}$	42 $\frac{1}{2}$
6 in. and larger. ....	50	35	..

**Cast Iron Pipe.**—The city of Minneapolis has deferred the awarding of contracts for its Cast Pipe requirements to January 9. The demand for future needs is light, as consumers are deferring their purchases, anticipating lower values. We quote: Water Pipe, 4 in., \$37 to \$38; 6, 8, 10 and 12 in., \$36 to \$37; over 12 in., \$35 to \$36, with \$1 extra for Gas Pipe.

**Coke.**—With the firing of 40 additional ovens, the output of By-Product Coke in this city and Milwaukee has been increased to 60,000 tons monthly. This is the largest tonnage of this grade offered the merchant trade at any point in the country, and while the use of Connellsville and Virginia grades is still extensive, nevertheless the by-producers are making big inroads on this trade. Reports from the Pocahontas field indicate the shutting down of many operations on account of the car shortage, and shipments into this district have been very light. For immediate delivery, By-Product Coke is selling at \$7.15, Chicago, and Connellsville is held on the basis of \$3.25 to \$3.50 at the ovens, equivalent to \$6.90 to \$7.15, f.o.b. Chicago.

**Old Material.**—Insistent demands of the railroads that cars be unloaded immediately upon their receipt to facilitate their movement, and the tight money market which has compelled speculative dealers to unload, have resulted in a break in the Old Material market ranging from \$1 to \$2 a ton on the various grades. The stocks that have accumulated in dealers' yards are of no small proportions, and haste is now being made for their disposal, which has developed a still further weakness. Large consumers have deferred buying during the past six weeks and are not anxious to cover, believing that the downward movement is not yet at an end. Railroad offerings during the week have been light, and no lists of importance can be expected until after the first of the year. We revise quotations on gross tons, car lots, f.o.b. Chicago, as follows:

Old Iron Rails. ....	\$28.00 to \$29.00
Old Steel Rails, 4 ft. and over. ....	19.50 to 20.00
Old Steel Rails, less than 4 ft. ....	18.50 to 19.00
Heavy Relying Rails, subject to inspection, 50 lb. and under. ....	31.00 to 32.00
Old Car Wheels. ....	25.25 to 26.00
Heavy Melting Steel Scrap. ....	17.00 to 17.50
Frogs, Switches and Guards. ....	18.00 to 18.50
Mixed Steel. ....	15.00 to 15.50

The following quotations are per net ton:

Iron Flash Plates. ....	\$23.00 to \$23.50
Iron Car Axles. ....	27.50 to 28.00
Steel Car Axles. ....	23.50 to 24.00
No. 1 Railroad Wrought. ....	17.00 to 17.50
No. 2 Railroad Wrought. ....	16.00 to 16.50
Railway Springs. ....	16.00 to 16.50
Locomotive Tires, smooth. ....	16.00 to 16.50
No. 1 Dealers' Forge. ....	13.50 to 14.00
Mixed Bushing. ....	12.50 to 12.75
Iron Axle Turnings. ....	11.00 to 11.50
Soft Steel Axle Turnings. ....	11.00 to 11.50
Machine Shop Turnings. ....	11.00 to 11.50
Cast Borings. ....	9.00 to 9.50
Mixed Borings, &c. ....	9.00 to 9.50
No. 1 Mill. ....	10.50 to 11.00
No. 2 Mill. ....	9.50 to 10.00
No. 1 Rollers, cut to Sheets and Rings. ....	12.50 to 13.00
No. 1 Cast Scrap. ....	17.50 to 18.00
Stove Plate and Light Cast Scrap. ....	14.00 to 14.50
Railroad Malleable. ....	18.00 to 18.50
Agricultural Malleable. ....	17.00 to 17.50

## Birmingham.

BIRMINGHAM, ALA., December 23, 1906.

**Pig Iron.**—Contrary to expectation, considerable business developed the past week. At this season of the year the holiday spirit usually prevails to such an extent that business is practically suspended for the time being, but this year orders have been gradually increasing each week since December 1, and more buyers are now in the market than at any time in the past two months. Inquiries cover every delivery from spot to the last quarter of next year, but the principal trading is for second and third quarter. Prices vary somewhat according to the condition of order books of sellers, but will average about as follows: January, \$23.50 to \$24; balance first quarter, \$23 to \$23.50; second

quarter, \$18.50 to \$19.50; last half, \$18, to \$19. The car situation remains unchanged, which means that it is as bad as it could possibly be. Efforts to accumulate sufficient stocks at the furnaces to prevent banking them during the holidays has only been partially successful, and if the miners stay out as long as usual this year the production for December will probably be restricted to some extent.

**Cast Iron Pipe.**—A majority of the foundries producing Soil Pipe will be closed down for the next 10 days. It is impossible to get a sufficient number of molders to work this season to operate satisfactorily, and the plants here take advantage of the suspension to make minor repairs and take their annual inventory. There are perhaps more orders on the books of these manufacturers to-day than ever before in the history of the business at this season of the year. This is due largely to the immense amount of building now being done throughout the country, owing to the great prosperity which every section is enjoying. The extremely mild winter we have had thus far has also enabled operations to be continued much longer than usual, and as a result none of the foundries have any stocks whatever on their yards. Prices on Water Pipe are stiffening as the season advances, and quotations at the present time for delivery the second quarter of 1907 are about as follows: 4 to 6 in., \$35; 6 to 12 in., \$33; over 12 in., average, \$30, with \$1 per ton extra for Gas Pipe.

**Old Material.**—The market is firm, with an advance of about 50c. per ton over the figures quoted a week since. The demand is as strong as ever, and dealers are highly elated over the prospects of a continuation of the excellent business they have enjoyed for the last few months during at least the first half of next year. Quotations are approximately as follows per gross ton, f.o.b. cars dealers' yards here:

Old Iron Rails. ....	\$22.00 to \$22.50
Old Iron Axles. ....	19.50 to 20.00
Old Steel Axles. ....	17.00 to 18.00
Old Car Wheels. ....	19.00 to 20.00
No. 1 Railroad Wrought. ....	19.50 to 20.00
No. 2 Railroad Wrought. ....	15.50 to 16.00
No. 1 Country Wrought. ....	15.50 to 16.00
No. 2 Country Wrought. ....	12.50 to 13.00
Wrought Pipe and Flues. ....	13.00 to 13.50
Railroad Malleable. ....	13.00 to 13.50
No. 1 Steel. ....	14.00 to 14.50
No. 1 Machinery Cast. ....	15.50 to 16.00
Stove Plate and Light Cast. ....	11.00 to 11.50
Cast Borings. ....	8.00 to 8.50

## Philadelphia.

PHILADELPHIA, PA., December 24, 1906.

**Pig Iron.**—Although this is the holiday season, business in all departments is unusually active. Prices of Pig Iron are about the same as they were last week as regards Foundry Irons, but Steel making material is distinctly dearer. Sales of the latter have been made at as high as \$23, at Lehigh Valley Furnace, for midsummer delivery, and large tonnages of the same have been made for delivery covering the last half of the year, at about 25c. less than for summer deliveries. There appears to be no abatement in demand, but everything that is offered is promptly taken for any delivery and without much demur in regard to prices. There is still a great diversity in quotations, and a limited quantity of Iron can be had for first quarter at \$25 to \$25.50 for No. 2 X, while for the last half \$23 to \$23.50 can be done, but the situation is so peculiar that almost every transaction is a law unto itself, so that quotations are more or less of a general rather than a specific character. Prospects for the new year appear to be phenomenally favorable, and, so far as now appears, present conditions are likely to continue indefinitely. Foreign Iron is in fairly good supply at \$22.50 to \$23, on dock here, for Middlesbrough No. 3, and \$24.50 to \$25 for Scotch. There is an increasing demand for the latter, but it is difficult to get early shipments from the other side, as several cargoes have just been loaded for Western consumers to be shipped via New Orleans. Quotations for deliveries the first quarter of 1907 may be given as \$25 to \$25.50 for No. 2 X Foundry, and \$23.50 to \$23.75 for Basic. For the second quarter, particularly if it includes some tonnage for the third quarter, 25c. to 50c. less might possibly be done, while the following figures represent quotations for deliveries in eastern Pennsylvania and adjoining districts during the last six months of the year:

No. 1 X Foundry. ....	\$26.00 to \$26.50
No. 2 X Foundry. ....	23.50 to 24.25
No. 2 Plain. ....	23.00 to 23.50
Standard Gray Forge. ....	22.00 to 22.50
Basic. ....	23.50 to 24.00
Low Phosphorus. ....	27.25 to 27.75
Malleable. ....	25.50 to 26.50
Middlesbrough No. 3, on dock. ....	22.50 to 23.00
Scotch, on dock. ....	24.50 to 25.00

**Finished Material.**—There is a very strong demand for Plates, Sheets and Bars, and prices are firm at the advanced rates quoted last week. Mills are extremely busy, but some time will be lost the coming week on account of the holidays, so that when they start up again early in January great activity will prevail. Specifications have



been coming in freely, and as far as can be seen the present favorable conditions will continue indefinitely. There is no change from the prices quoted last week.

**Old Material.**—The market is extremely strong, and while there is no general advance from last week's quotations, it would be difficult to place large orders without paying something more than during the past two or three weeks. Bids and offers for deliveries in buyers' yards are about as follows:

Steel Crops.....	\$20.00 to \$20.50
No. 1 Steel Scrap.....	19.50 to 20.00
Low Phosphorus.....	24.00 to 24.50
Old Steel Axles.....	24.50 to 25.00
Old Iron Axles.....	32.00 to 32.50
Old Iron Rails.....	27.75 to 28.25
Old Car Wheels.....	23.00 to 23.50
Choice No. 1 R. R. Wrought.....	23.25 to 23.75
No. 1 Yard Scrap.....	21.50 to 22.00
Long and Short.....	19.50 to 20.00
Machinery Scrap.....	21.50 to 22.00
Wrought Iron Pipe.....	17.25 to 17.50
No. 1 Forge Fire.....	17.00 to 17.50
No. 2 Light.....	12.00 to 12.50
Wrought Turnings.....	16.25 to 16.75
Axle Turnings.....	17.00 to 17.50
Stove Plate.....	17.00 to 17.50
Cast Borings.....	13.00 to 13.50
Grate Bars.....	15.50 to 16.00

## Pittsburgh.

PARK BUILDING, December 26, 1906.—(By Telegraph.)

**Pig Iron.**—Inquiries for Pig Iron have been more numerous, most of them being for Iron for second and third quarter delivery and also for shipment over last half of next year. We note sales of 2000 tons of Malleable Bessemer for second quarter delivery at \$22 and 1500 tons for third quarter delivery at \$21.50, Valley furnace. We also note a sale by a local furnace interest of 10,000 tons of Standard Bessemer Iron for delivery over last half of the year at \$21 at furnace or \$21.55, Pittsburgh. We quote Standard Bessemer for delivery in first quarter at \$22.50 to \$23; for delivery in second quarter, \$22, and for delivery over last half of next year at \$21, Valley furnace. Small lots of Northern No. 2 Foundry for prompt delivery continue to sell at \$24.50 to \$25, Valley furnace. For first quarter delivery furnaces quote Northern No. 2 at \$23.50 to \$24, Valley furnace. There is little doing in Northern Forge Iron, but it is firm at \$22 to \$22.50, Valley furnace, or \$22.85, to \$23.35, Pittsburgh.

**Steel.**—Inquiries for Steel are quiet, as most consumers are covered by contract on sliding scale arrangements and in other ways. We continue to quote 4 x 4 in. Bessemer Billets at \$29.50 to \$30, and Open Hearth Billets \$32.50 to \$33, Pittsburgh. We quote Sheet and Tin Bars in random lengths at \$29.50 to \$30, Pittsburgh, an advance of 50c. a ton being charged for Cut Bars.

(By Mail.)

Prices on Merchant Pipe have been advanced \$2 and Boiler Tubes \$4 a ton. While no official advices have been given out, it is expected that prices on Sheets and Tin Plate will also be advanced in the near future, possibly prior to January 1. There has been a fairly active demand for Pig Iron in the past week, sales of Malleable Bessemer for second quarter having been made at \$22 and for third quarter at \$21.50, Valley furnace. New business in Finished Iron and Steel continues heavy, and the mills will enter the new year with more unfilled orders on their books than ever before in the history of the trade. All signs point to an active year in the Iron and Steel trades in 1907, and it is believed that relatively high prices will prevail the entire year.

**Ferromanganese.**—The demand has been quiet, but the market is strong. We continue to quote 80 per cent. Foreign Ferro at \$85 for prompt shipment, while \$80 to \$82.50 is quoted for forward delivery.

**Wire Rods.**—Consumers are giving practically any prices for Rods that sellers care to ask to get prompt delivery. We quote Bessemer Rods at \$37 and Open Hearth \$38, f.o.b. Pittsburgh. These prices are nominal, as it is probable that higher figures would be paid if sellers would guarantee prompt shipment.

**Muck Bar.**—While the demand has been quiet the market is firm, and Muck Bar for early delivery is hard to obtain. We quote best grades, made from all Pig Iron, at \$36 to \$37, and from part Scrap at \$34, Pittsburgh.

**Skelp.**—While not much new tonnage is being placed, the mills are filled up on contracts on which consumers are specifying freely. Prices are firm, and we quote: Grooved Steel Skelp, 1.65c. to 1.70c.; Sheared Steel Skelp, 1.70c. to 1.75c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh, these prices depending on widths and gauges.

**Steel Rails.**—The Edgar Thomson mill of the Carnegie Steel Company at Bessemer has closed down until some time in January, to make repairs and to give the men a needed rest. The Carnegie Company entered orders the past week for about 30,000 tons of Standard Sections, and for considerable tonnage in Light Rails. We quote Light Rails as follows: \$33 for 20 to 45 lb.; \$34 for 16-lb., and \$35 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

**Structural Material.**—No local contracts of importance were placed the past week, but specifications are coming in freely and many small orders are being booked which aggregate considerable tonnage. It is stated that the total product made by the American Bridge Company this year will amount to about 600,000 tons, by far the largest year's output in its history. Prices are firm, as follows: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80.; Angles, 3 x 2 x 1/4 in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3 1/2 in., 1.80c.; Tees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3-in. are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

**Plates.**—A number of Plate mills are practically out of the market as sellers for delivery in first half of next year, but are prepared to take orders for delivery in second half on the basis of 1.70c. to 1.80c., Pittsburgh. Specifications on contracts are pouring into the mills in enormous volume, and while shipments are heavy, the mills are not able to catch up on deliveries to any extent. We quote: Tank Plates, 1/4 in. thick, 6 1/4 in. up to 100 in. width, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than 1/4 in. to and including 3-16 in.	
Plates on thin edges.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

**TERMS.**—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of 1/2 of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

**Sheets.**—Reports from unofficial sources are that an advance in Black and Galvanized Sheets of \$2 a ton may be announced prior to January 1, but this has not been confirmed. It is a fact that some of the mills are able to get premiums of \$1 a ton on Sheets for prompt delivery. The continued scarcity and high prices of Sheet Bars and the higher prices of labor effective January 1, together with the enormous demand for Sheets and the heavy tonnage on the books of the mills for delivery next year, would all seem to warrant higher prices. Stocks in warehouses of jobbers are reported lighter than usual, and are badly broken. Prices are very firm, and we quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.55c.; Nos. 12 and 14, 2.65c.; Nos. 15 and 16, 2.75c.; Nos. 17 to 21, 2.90c.; Nos. 22 and 24, 3.05c.; Nos. 25 and 26, 3.25c.; No. 27, 3.45c.; No. 28, 3.65c.; No. 29, 3.90c., and No. 30, 4.15c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.15 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

**Hoops and Bands.**—Only small orders are being placed, and not many of these, the trade having covered its requirements some time ago, and in some cases for delivery over all of 1907. Buyers are specifying freely on contracts, and the mills are behind in deliveries. Prices continue very firm, and we quote: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

**Tin Plate.**—Unofficial advices are that an advance in prices of Tin Plate will be made prior to January 1. Tin Bars and Pig Tin continue very high, and with heavy tonnage on the books of the mills a further advance in Tin Plate would seem to be warranted. Not much new tonnage

is being placed, as the large consumers covered their requirements some time ago for deliveries running as far ahead as the third quarter of 1907. We quote \$3.90 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

**Railroad Spikes.**—The demand continues heavy and the mills are not catching up on deliveries to any extent except on the larger sizes, being from six weeks to three months behind in shipments on the smaller sizes. Prices are very firm, and we quote Railroad Spikes at \$2.40 to \$2.50 per 100 lb. on contracts for future delivery, while \$2.65 to \$2.75 is quoted on orders for reasonably prompt delivery.

**Merchant Steel.**—While the amount of new business being placed is small, specifications from consumers on contracts continue heavy and the mills are not catching up much on deliveries. Prices are firm and we quote: Smooth Finished Merchant Steel, 1.85c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Cutter Shoe, 2.15c. to 2.20c.; Railroad Spring Steel, 1.75c. to 1.80c.; Toe Calk Steel, 2.10c. to 2.15c.; Crucible Tool Steel, 6c. to 8c. and upward, depending on quality. The demand for Shafting is fairly active, the mills being somewhat behind in deliveries. We quote Cold Rolled Shafting at 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory.

**Iron and Steel Bars.**—The market on both Iron and Steel Bars continues very strong. The amount of new tonnage being placed with the mills is fairly heavy, but is not quite as large as last month and in October. The higher prices on Iron and Steel Scrap have further strengthened the market on Iron and Steel Bars. Local mills continue to quote 1.80c. to 1.85c. on Iron Bars, but to certain competitive points slightly lower delivered prices are being made. Some of the Eastern mills continue to offer Iron Bars at slightly less than 1.80c. for delivery in the Pittsburgh District. We quote Steel Bars at 1.80c. to 1.65c. base, half extras, f.o.b. Pittsburgh, but note that premiums of \$1 and \$2 a ton over these prices are being paid for reasonably prompt shipment.

**Spelter.**—The demand continues unusually heavy, and some of the smelters have no Spelter to offer for delivery before March or April. Prime grades of Western are now held at 6.50c. St. Louis, equal to 6.62½c. Pittsburgh.

**Pipes and Tubes.**—Effective December 21, the National Tube Company and outside mills announced an advance of another point in basing discounts equal to \$2 a ton, making the third advance in prices of Merchant Pipe within a month, the first advance being \$4 and the second and third each \$2, thus practically restoring prices in effect in April, 1905. Prices on Oil country goods have also been advanced an average of 5 per cent., which is equal to about \$4 a ton. We note that an inquiry is in the market for 285 miles of 8-in. Line Pipe for delivery to the Pacific Coast, and it is expected this contract will be placed within a short time. A Western consumer has placed a fair sized order for Iron Line Pipe with a local mill. The mills will close the year with more undelivered tonnage on their books than ever before in their history, and with the enormous amount of business in prospect the year 1907 promises to be one of great activity. We have advanced our prices \$2 a ton, the extreme discount on Merchant sizes of Steel Pipe now being 77 and 5 per cent. off to the large trade. Prices on Iron Pipe are also higher and the market is very strong. The official discounts, which are shaded one point or more to the large trade, are as follows:

#### Merchant Pipe.

	Jobbers, carloads.	
	Black.	Galv.
¾ to 1 in.	68	52
1 in.	70	56
1½ in.	72	60
2 to 6 in.	76	66
7 to 12 in.	71	56
Extra strong, plain ends:		
¾ to 1 in.	61	49
1 to 4 in.	68	56
4½ to 8 in.	64	52
Double extra strong, plain ends:		
¾ to 8 in.	57	46

**Boiler Tubes.**—Effective December 20, prices on Boiler Tubes were advanced two points, or \$4 a ton, thus partially restoring prices in effect in April, 1905. Prices on Locomotive Tubes have also been advanced from 5 to 12½ per cent., which on 2-in. Tubes is equal to nearly \$8 a ton. This was foreshadowed in this report last week and is due to the heavy demand and higher prices on raw materials. Official discounts are now as follows:

#### Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	48
1½ to 2½ in.	43	60
2½ in.	48	62
2½ to 5 in.	55	68
6 to 13 in.	43	60

**Iron and Steel Scrap.**—This is usually a dull season in the Scrap trade, and the present is no exception, but we note that the market is firm, and indications are that the demand

will be very much heavier after January 1. Opinion as to the future is divided, consumers believing that the market will not be higher, while dealers are confident that prices will advance all along the line. Dealers continue to quote as follows: Heavy Steel Melting Scrap, \$20, for Pittsburgh or Sharon delivery; No. 1 Wrought Scrap, \$21 to \$21.50; No. 2 Wrought Scrap, \$19 to \$19.50; Old Steel Rails, short pieces, 6 ft. and under, for Open Hearth purposes, \$20; Old Steel Rails, rerollers, \$22.50; Wrought Turnings, \$15.50 to \$15.75; Low Phosphorus Melting Stock, \$25; Bundled Sheet Scrap, \$17.25 to \$17.50; Cast Iron Borings are \$13 to \$13.25; Old Car Wheels, \$25; Steel Axles, \$24; No. 1 Cast Scrap, \$20; Railroad Malleable, \$19 to \$19.50; Cast Iron Borings, \$12.75 to \$13; Iron Axles, \$32 to \$33; Stove Plate, \$16 to \$16.50, and Grate Bars, \$15.50. All prices are per gross ton, f.o.b. Pittsburgh, unless otherwise specified.

**Coke.**—New demand for both Furnace and Foundry Coke is only fair, the large consumers being pretty well covered by contracts. Strictly Connellsville Furnace Coke continues to command \$3.50 to \$3.60, and 72-hr. Foundry has sold as high as \$4.25 at oven for prompt delivery. The supply of cars is reported uniformly good and shipments of Coke are heavier than ever before in the history of the region. We quote strictly Connellsville Furnace Coke for prompt delivery at \$3.50 to \$3.60 and 72-hr. Foundry at \$4.25 at oven. On contracts for first half of the year delivery minimum prices on Connellsville Furnace Coke are \$3.10 to \$3.25 and on 72-hr. Foundry \$3.75 to \$4 a ton at oven. The output of Coke continues to break all records, the Upper and Lower Connellsville regions having an estimated production last week of 406,167 tons.

## Cincinnati.

FIFTH AND MAIN STS., December 26, 1906.—(By Telegraph.)

**Pig Iron.**—The market has assumed a decidedly stronger aspect the past week and sellers appear to be more firmly entrenched than at any time the past three months. Inquiry for last half delivery has developed to a marked degree, and is apparently from all classes of melters and all sections of the country. Prices for prompt and first quarter Iron have practically merged, with perhaps 50c. variation in favor of spot where it is on track and accessible. A slight advance all along the line is well established, first quarter being quotable from \$23 to \$23.50; second quarter, \$19.50 to \$20, and third quarter, \$18.50 to \$19, Birmingham, for No. 2. There appears to be a strong feeling that the market will naturally be affected by the inaction of the furnaces incident to the holiday season, the demand for delayed contracts exerting a strenuous effect on any available tonnage that may be in sight, causing a still further advance in prices. There is no apparent change for the better as regards car service, the matter of equipment perhaps being the strongest deterring factor in the situation of to-day. This will probably cause continued shortage as the month advances, and general conditions will be but a repetition of the situation as it exists to-day. Northern Irons are strong, \$20, furnace, being well established for the last half of next year. High Silicon Irons are in heavy demand, but hard to obtain, with prices abnormally high. There is an inquiry from a southern Ohio melter for 1000 tons of Northern and 1000 tons of Southern for third quarter delivery, 1500 tons of Malleable from a northern Ohio concern for second quarter delivery, 2000 tons of Basic from another southern Ohio consumer, while another consumer in the same territory is inquiring for a large tonnage of indefinite proportions. Bird Furnace is reported shut down for want of Ore and Kelly for want of Coke, with a number of others on the ragged edge. Freight rates from the Hanging Rock District to Cincinnati are \$1.15, and from Birmingham, \$3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$26.50 to \$27.00
Southern Coke, No. 2.....	26.00 to 26.50
Southern Coke, No. 3.....	25.50 to 26.00
Southern Coke, No. 4.....	25.00 to 25.50
Southern Coke, No. 1 Soft.....	26.50 to 27.00
Southern Coke, No. 2 Soft.....	26.00 to 26.50
Southern Coke, Gray Forge.....	23.00 to 23.50
Southern Coke, Mottled.....	22.00 to 22.50
Ohio Silvery, 8 per cent. Silicon.....	31.15 to 31.65
Lake Superior Coke, No. 1.....	26.65 to 27.15
Lake Superior Coke, No. 2.....	26.15 to 26.65
Lake Superior Coke, No. 3.....	25.65 to 26.15

#### Our Wheel Irons.

Standard Southern Car Wheel.....	29.00 to 29.50
Lake Superior Car Wheel.....	27.50 to 28.00

**Coke.**—The demand is fairly active, with shipments coming forward with more or less irregularity. This is perhaps due to the cold weather, and will be more pronounced as the season advances. We quote the best brands of Connellsville and Virginia Foundry from \$4.25 to \$4.50, f.o.b. oven.

**Finished Iron and Steel.**—The demand for Bar Iron is exceedingly active. Prices are firm, but unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.93c., with half extras; the same, in smaller lots, 2.10c., with full



extras; Steel Bars, in carload lots, 1.73c., with half extras; the same, in smaller lots, 1.95c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, 1/4-in. and heavier, 1.83c., in carload lots; in smaller lots, 2c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, 1 x 1/4 in. or heavier, 1.93c., in carload lots.

**Old Material.**—Dealers are finding a ready sale for all the Scrap that can be obtained, and prices are strong and fairly well maintained. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 Railroad Wrought, net ton.....	\$17.75 to \$18.25
Cast Borings, net ton.....	9.50 to 9.75
Steel Turnings, net ton.....	11.75 to 12.75
No. 1 Cast Scrap, net ton.....	16.75 to 17.75
Old Iron Axes, net ton.....	26.75 to 27.75
Old Iron Rails, gross ton.....	27.00 to 27.50
Old Steel Rails, long, gross ton.....	19.25 to 20.25
Relaying Rails, 56 lb. and up, gross ton.....	28.75 to 29.75
Old Car Wheels, gross ton.....	22.75 to 23.25
Low Phosphorus Scrap, gross ton.....	21.25 to 21.75

The following is taken from a circular issued to Cincinnati Pig Iron agents by the Alabama Great Southern Railroad Company: "Our Northern connections advise us that they will advance the rates on Pig Iron from Ohio River crossings, effective February 1, as follows: To Indianapolis, \$1.15; to Chicago and points taking the same rates, \$1.60; to Milwaukee and points taking the same rates, \$2; to Lake Michigan ports, \$2; to Green Bay ports, Green Bay to Marinette and Menominee, Wis., inclusive, \$2.20 per ton." The above figures result in the following advances: To Indianapolis, 15c.; to Chicago points, 20c.; to Milwaukee points, 15c., and other points, 20c. per ton. These advances merely affect the through rates on Pig Iron from Southern furnaces to the points named, but have no bearing on local rates from the Ohio River to the points named.

## Cleveland.

CLEVELAND, OHIO, December 24, 1906.

**Iron Ore.**—About the only interesting feature of the Iron Ore market the past week was the extensive chartering of vessel tonnage by shippers that had not previously made their freight contracts for Ore for 1907 with the vessel owners. All the large shippers with one exception have now made their charters for the coming year. Among the shippers that made season freight contracts with the vessel men the past week was the United States Steel Corporation. The amount of Ore that was covered by this corporation was not made public, but it was announced that it was about the same tonnage that it chartered last year. The Steel Corporation will ship more Ore in 1907 than it did the past year, but it is expected that the increased capacity of the fleet of the Pittsburgh Steamship Company will more than cover the increase in shipments. All the Ore carrying contracts made the past week were at this season's rates, the same as other carrying contracts for next year had previously been made. The boats will get 75 cents from the head of Lake Superior, 70 cents from Marquette and 60 cents from Escanaba. The Ore market is quiet, few sales being reported, as the season's expected output had previously been pretty well sold. Ore quotations are: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

**Pig Iron.**—The Pig Iron situation is growing more serious every day, because of the scarcity of Iron for delivery for the first half of 1907. One dealer being unable to find Iron for early delivery to supply the urgent demands of his customers, was forced this week to enter the market with foreign Iron. The surprise of the week has been the numerous inquiries from large consumers for Iron for the first half. It was supposed that these consumers had covered pretty well for that delivery. Foundries that have delayed in making purchases will have to do the best they can by picking up a little here and there from furnaces that have not sold their entire output. Many furnaces have sold their entire output for 1907, while the majority are believed to have sold three-fourths of their expected output for the third quarter. Furnaces are not soliciting business for the last half, but are caring for their old customers who desire to make contracts for that period. There is a strong tendency among foundrymen now to cover for the last half, and considerable Iron for that delivery has been sold the past week. Some foundries have been able to cover for the first half by contracting for the last half also at the same time. A small amount of Pig Iron remains for sale for the second quarter, but furnaces as a rule do not desire to sell, being afraid of deliveries. Foundrymen are facing a serious situation in this territory at present. Not only is it almost impossible for them to buy Iron for prompt shipment or for the first half, but many of them are unable to get all the material previously contracted for for the last half 1906 delivery. Neither are they able to get Southern Iron due on contracts. They feel that prices will go still higher, and this feeling has

caused the heavy buying for the last half. No quotations are given for Northern No. 2 Foundry for spot shipment, or the first half, any one who has any for sale getting all he can for it. One dealer puts the price at from \$26 to \$29, f.o.b. Cleveland, for the first half. One foundry, that wanted 2500 tons of No. 1 Foundry, for June delivery, got a quotation of \$25. The quotations for the last half are as follows, f.o.b. Cleveland:

Northern Foundry, No. 1.....	\$22.50 to \$23.50
Northern Foundry, No. 2.....	22.00 to 23.00
Northern Foundry, No. 3.....	21.50 to 22.50
Gray Forge.....	21.00 to 22.00
No. 2 Southern.....	19.00

**Coke.**—The Coke market is firm with no change in prices. Foundry Coke is quoted at \$4.25 at oven for prompt shipment, and Furnace Coke is selling at \$3.50 to \$3.75 at oven. Few inquiries are being made for future deliveries.

**Finished Material.**—There has been an unusually large quantity of all kinds of Finished Material sold the past week, considering the fact that there is usually a dull spell during the holiday season. Prices remain firm but as a rule the quotations are the same as a week ago. Some mills are getting a little further behind with their orders while others are able to keep about even. The demand for Plates is heavier and deliveries are not promised within two or three months. Plates are selling on the basis of 1.70c. to 1.80c., Pittsburgh, but one dealer is asking 2c., Pittsburgh. Eastern mills are still selling Plates in this district for prompt delivery at \$2 premium. Forging Billets are selling at \$38 to \$40, Pittsburgh, for prompt shipment, and Re-rolling Billets at \$32, Pittsburgh. The demand for Structural Material continues good, but the situation is easier than in other lines, and deliveries are more prompt. Some of the smaller mills are selling Bars on 60 to 90 days' delivery, with Iron Bars on the basis of 1.80c., Pittsburgh, and Steel Bars 1.60c., Pittsburgh. Local warehouse prices are 2c. for Iron Bars and 1.95c. for Steel Bars. The demand for Sheets is strong and a large local mill has notified its customers that it cannot make deliveries within about 12 weeks. Four weeks longer are required for deliveries for open-hearth products. Sheets are quoted as follows out of stock: Blue Annealed, No. 10, 2.25c.; No. 28, One Pass Cold Rolled, 2.90c.; No. 28, Galvanized, 3.90c. Specifications against contracts are coming in heavily, buyers being anxious to get the full amount of material contracted for. Foundrymen as a rule are not quoting prices for Castings for the third quarter of 1907. They look for an advance in price of Castings on January 1. They are delayed in making deliveries by a scarcity of molders, there being only about three-fourths as many molders as are needed at present in this city.

**Old Material.**—The demand for Old Material, which fell off a week ago, continues light and prices are weak. Many consumers have purchased their supply for the next three months and material is now more plentiful. The following are dealers' prices to the trade per gross ton, f.o.b. Cleveland:

Old Steel Rails.....	\$19.00 to \$19.75
Old Iron Rails.....	26.50 to 27.00
Old Car Axes.....	29.75 to 30.25
Old Car Wheels.....	21.50 to 22.00
Heavy Melting Steel.....	17.50 to 18.00
Cast Borings.....	10.50 to 11.00
No. 1 Bushing.....	16.50 to 17.00
No. 1 Railroad Wrought.....	19.50 to 20.00
No. 1 Cast.....	20.00 to 20.50
Iron and Steel Turnings and Drillings.....	13.25 to 13.75

Due to the large increase in its business in the lake districts, the Pittsburgh Automatic Vise & Tool Company, Pittsburgh, will open offices on January 1 in Room 438, Schofield Building, Cleveland, Ohio, in charge of H. R. Carson.

**The Dominion Iron & Steel Company's Affairs.**—President Plummer of the Dominion Iron & Steel Company, Sydney, Nova Scotia, said in a recent interview that the entire steel plant is now in operation, also that before the end of December a third blast furnace would be blown in. The company has large orders from the Canadian Pacific Railroad, and has business booked sufficient to keep the rail mill employed for more than six months. The output has been at the rate of 16,000 tons of rails a month. The contract signed at Montreal December 8 by President James Ross of the Dominion Coal Company and President Plummer of the steel company is for two years, and is said to provide that pending a settlement by the courts of the recent dispute the steel company shall pay the fuel company \$2.80 a ton for slack coal and \$3.05 for run of mine, as against \$1.24 a ton under the old contract. The new agreement dates from November 6, 1906, and the amount involved is 65,000 tons a month.

## New York.

NEW YORK, December 26, 1906.

**Pig Iron.**—The feature of the market has been the heavy buying, for delivery during the second half, of Basic Pig, by Steel works. One tidewater plant has bought 30,000 tons, and is negotiating for more, while another concern has bought 15,000 tons at prices ranging from \$22 to \$24, at furnace. There have been large sales of Foundry Iron for the second half of 1907, among the purchases being those of locomotive builders, aggregating 20,000 tons. There is good buying from all quarters. We quote spot Northern Iron, in small lots, \$26.50 to \$27 for No. 1 X, tidewater, and \$25.50 to \$26 for No. 2 X. The business is very limited. For the first half we quote \$26 to \$26.50 for No. 1 Foundry, \$24.50 to \$25 for No. 2 Foundry and \$24 to \$24.50 for No. 2 Plain, tidewater. For the second half we quote No. 1 X \$25 to \$25.50, and No. 2 Foundry \$23.50 to \$24. Southern Iron is quoted \$27 to \$27.50 for No. 2, prompt, \$25 to \$25.50 for No. 2, second quarter, and \$22.50 to \$23 for second half. No. 3 Middlesbrough is \$22.50 to \$23, on dock, and Scotch Iron \$24.50 to \$25, on dock.

**Steel Rails.**—The entrance of the Bethlehem Steel Company into the Rail market again after several years in which it has not been a factor, is the most interesting feature of the week's news. It has booked the latest Harriman order, 22,500 tons for the Oregon & Washington, deliveries beginning in July, 1907. The Bethlehem product will be Open Hearth Steel Rails, and for special purposes it will roll a nickel Steel or a nickel chrome Steel Rail. The new Rail mill is expected to be ready about July 1. Other orders of the week include 4000 tons for the Iowa Central, 5500 tons for the Bangor Railway and 1800 tons for the Lexington Railway, the last two being trolley lines. Industrial railroads have ordered an aggregate of 3000 tons in the past week. A further advance of \$1 a ton in Light Rails is announced, making \$2 within a month, and bringing the base price up to \$33, Pittsburgh.

**Structural Material.**—The bridge companies have made only moderate additions to their order-books recently, and there has been rather close competition for certain contracts. The Blackwell's Island approaches have not been let as yet. The lowest bid is considerably below that of the nearest competitor. Of the three lots of Erie barge canal bridges included in the last call for bids the American Bridge Company has one, and two remain to be placed. The total is 5000 tons. For the Senate office building at Washington, D. C., an 800-ton contract has been given to the American Bridge Company. Most railroad work recently let has been in lots of a few hundred tons. An exception is the Atlantic & Birmingham Railroad's bridge contract, which was taken by the American Bridge Company. There is not the heavy tonnage of large Structural contracts pending to-day that was commented on at the close of 1905, but the aggregate of the jobs now being figured on is large. A good deal of railroad bridge construction will come to the shops, it is expected, after the new year is fairly begun. In the past year the American Bridge Company has booked an average of about 60,000 tons a month, making a total of 700,000 tons, while its output has averaged about 50,000 tons a month. The Structural mills have noticed an improvement in the volume of business in the past few weeks, and deliveries are not quite as prompt now as at the beginning of the month. We quote as follows for tidewater deliveries on mill shipments: Beams, Channels, Angles and Zees, 1.84½¢; Tees, 1.80½¢; Bulb Angles and Deck Beams, 1.99½¢. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10¢. Sales out of stock of material cut to length are at 2½¢ to 2½¢.

**Bars.**—Bar Iron orders now being placed cover quite a fair tonnage. Consumers appear anxious to place contracts on the basis of 1.70¢, Pittsburgh, or 1.84½¢, tidewater, to cover deliveries for the next three or four months, but the market is firm at 1.89½¢, tidewater, with sales reported at a still higher price. The advanced cost of production, it is asserted, will prevent the mills from yielding under present circumstances to the wishes of buyers. Some of the Eastern mills are now asking 1.80¢ to 1.90¢ at their own works. Steel Bars continue to be quoted at 1.74½¢ to 1.84½¢, tidewater, but the lower price can only be obtained on deliveries to be made far in the future.

**Plates.**—The market is quiet, partly because of the holiday season and partly because most consumers covered their requirements before the last advance in quotations. The range of prices from those asked by Western mills to the present rate named by Eastern manufacturers is as follows at tidewater in carload lots: Sheared Tank Plates, 1.84½¢ to 2.04½¢; Flange Plates, 1.94½¢ to 2.14½¢; Marine Plates, 2.24½¢ to 2.44½¢; Firebox Plates, 2.75¢ to 3.50¢, according to specifications.

**Cast Iron Pipe.**—The demand continues fully as active as it has been. Quite a number of buyers are in the market for 1000-ton lots or more. The water and gas companies in Pennsylvania are now buying freely, and foundries

are steadily filling up farther into the future. In some cases orders have been placed for delivery running into the second half of next year. Prices are likely to be again advanced, to meet the increased cost of Pig Iron, but for the present quotations are reported at \$35 to \$35.50 per net ton, tidewater, for 6-in.

**Old Material.**—While Foundry material continues in good demand and prices are strong, Cast Borings are comparatively speaking the most active and best sustained article in the list. Borings and Turnings are now receiving much attention from rolling mills for the purpose of averaging costs with higher priced stock. Among the transactions of the week were sales aggregating about 2500 tons of Wrought Scrap, which brought \$23.50, delivered, at works in eastern Pennsylvania. In most lines, however, sales are now running light, on account of the holiday season. Approximate prices for New York and vicinity, per gross ton, are as follows:

Old Iron Rails.....	\$25.00 to \$25.50
Relaying Rails.....	28.00 to 29.00
Old Steel Rails, rerolling lengths.....	18.50 to 19.00
Old Girder and T-Rails for melting.....	16.25 to 16.75
Heavy Melting Steel Scrap.....	16.25 to 16.75
Standard Hammered Iron Car Axles.....	29.00 to 30.00
Old Steel Car Axles.....	21.50 to 22.50
No. 1 Railroad Wrought.....	21.50 to 22.00
Iron Track Scrap.....	19.00 to 20.00
No. 1 Yard Wrought, long.....	18.50 to 19.00
No. 1 Yard Wrought, short.....	18.00 to 18.50
Wrought Pipe.....	14.50 to 15.00
Light Iron.....	11.00 to 11.50
Cast Borings.....	10.50 to 11.00
Wrought Turnings.....	14.50 to 15.00
Old Car Wheels.....	21.75 to 22.25
No. 1 Heavy Cast, broken up.....	18.50 to 19.50
Stove Plate.....	15.00 to 15.50
Grate Bars.....	14.00 to 14.50
Malleable Cast.....	18.00 to 19.00

## Metal Market.

NEW YORK, December 26, 1906.

**Pig Tin.**—The London market closed Friday and will not reopen until Thursday morning. In the absence of advices from that center the little business transacted here has been within a narrow range of prices. On Thursday Tin was sold at 42.60¢. Friday and Monday sales were made at 42.70¢, and this afternoon some little business developed which was transacted at 42.80¢. The markets will undoubtedly be very dull from now until after the first of the year, but the statistical position shows some strength and well informed men in the trade are looking for an increased business in January at advancing prices. The receipts at American ports since December 1 have amounted to 3858 tons, which are probably in excess of consumption. The afloats amount to 2215 tons.

**Copper.**—Imperative needs of consumers have been filled at higher prices. The general range for Lake is 23.50¢ to 24¢; for Electrolytic, 23.25¢ to 23.75¢, and for Casting grades, 23.12½¢ to 23.62½¢. Some Lake has been sold at 24¢; in fact, lots of all grades have been sold at the outside prices. It is claimed that the high figure of 25¢ has been obtained for small lots of Lake, and while this is entirely probable, it has not been confirmed. The cables received this morning all tell of the continued prosperity and the urgent demand for more Copper in Europe in spite of the higher prices. The London Exchange being closed to-day no quotations are available, but the market on Friday closed at £106 15s. for spot and £108 5s. for futures. It is reported that the United Metals Selling Company has temporarily withdrawn its offers of April shipment. There is no doubt that some buyers have been obliged to curtail their takings. The high price of Ingot Copper has forced another advance on Sheets, which are now quoted at 29¢, base. Those best acquainted with the consuming demand and in position to learn the general tenor of the trade express the belief that consumption as yet has not been curtailed owing to the high prices, and it is further believed that prices may reach the 25¢ level before this occurs, if it does even then.

**Pig Lead.**—Prices are strong, and spot stocks cannot be obtained at less than 6.30¢. Future deliveries are offered at lower figures, and the American Smelting & Refining Company's price covering old contracts is 6¢; new business is accepted only at price current on date of shipment. In St. Louis the market is considerably easier at 6.05¢ to 6.10¢. In London Lead is strong, the market closing there on Friday at £19 17s. 6d., an advance of 10s. above the price of a week previous. Stocks are low in Europe, and it is not believed that American consumers can secure any large amount of metal from this source, even if they are willing to pay the high price which now prevails. Of course, at the present London market price it would not be possible to import at a profit.

**Spelter.**—Business is extremely active, and the galvanizing mills specially have taken large quantities of Spelter. This is most noticeable in the case of Galvanized Iron Sheets, which have been used for temporary constructions or as roof coverings, consequently the demand for Spelter



has increased enormously. Prices are practically unchanged at 6.67½c. for Prime Western in New York and 6.55c. in St. Louis. In London the market on Friday was slightly lower at £28.

**Antimony.**—There is some talk of easing in prices, but it is probably nothing more than the customary shading that has been made from time to time to favor customers by dealers. Cookson's is still quoted at 26c.; Hallett's at 25c.; but other brands probably can be obtained at 24c. to 25c. As has been previously stated in these market reports, these prices can undoubtedly be shaded.

**Ferroalloys.**—There seems to have been a considerable falling off in the demand for Ferromanganese, but prices are still steady around \$78 at seaboard. Ferrosilicon continues strong and \$106 to \$108 is quoted. The market in Ferrochrome is unchanged, ranging from \$150 upward, according to analysis.

**Tin Plate.**—Prices are unchanged at \$4.09 per base box, f.o.b. New York, and \$3.90, f.o.b. Pittsburgh. In Swansea prices are unchanged at 15s.

**Old Metals.**—Selling prices have not advanced with the same rapidity that Ingot Copper has. The range of quotations is represented by the following dealers' selling prices:

	Cents.
Copper, Heavy Cut and Crucible.....	21.50 to 22.00
Copper, Heavy and Wire.....	21.00 to 21.50
Copper, Light and Bottoms.....	19.50 to 19.75
Brass, Heavy.....	15.50 to 15.75
Brass, Light.....	12.50 to 13.00
Heavy Machine Composition.....	19.50 to 19.75
Clean Brass Turnings.....	14.25 to 14.75
Composition Turnings.....	17.00 to 17.75
Lead, Heavy.....	6.00
Tea Lead.....	5.75
Zinc Scrap.....	5.00

### Iron and Industrial Stocks.

NEW YORK, December 26, 1906.

Interest in the stock market has, latterly been mainly in railroad stocks, which have been fluctuating rather violently with the changes in the money market. In sharp contrast with that state of affairs the Iron and Steel stocks were quite steady, fluctuations being within a narrow range up to last Monday, when quite a severe decline occurred. Following are high and low prices on active stocks from Thursday of last week to Monday of the present week: United States Steel common 46½ to 48½, preferred 102½ to 104¼; Car & Foundry common 41 to 43; Locomotive common 71¼ to 73¾; Steel Foundries preferred 44¼ to 45¾; Colorado Fuel 51½ to 56½; Pressed Steel common 51¼ to 54; Republic common 37 to 39½, preferred 96 to 97¾; Cast Iron Pipe common 45¼ to 46¼; Can preferred 53½ to 54¾. The market improved to-day, last transactions up to 1.30 p.m. being reported at the following prices: United States Steel common 47¼, preferred 103¾; Car & Foundry common 42, preferred 101; Locomotive common 71½, preferred 111, ex-dividend of 1¼; Steel Foundries common 10, preferred 44¼; Colorado Fuel 52¾; Pressed Steel common 53½, preferred 99; Railway Spring common 51½; Republic common 37½, preferred 96; Sloos-Sheffield common 73½; Tennessee Coal 160; United States Cast Iron Pipe common 46¼; Can common 6, preferred 53¾.

The statement of the Crucible Steel Company of America, Pittsburgh, for the quarter ended November 30, 1906, is as follows: Total net earnings, after deducting all expenditures for repairs, interest on bonds and mortgages, &c., \$542,344.77. The sum of \$10,922.25 was set aside as a reserve for contingencies, leaving a balance of \$531,422.52. Out of this a quarterly dividend of 1½ per cent. on the preferred stock was declared, amounting to \$366,547.50, leaving a surplus for the quarter of \$164,875.02. The report states that "the inventory has been valued upon the basis of August 31, 1906, prices. Had it been valued at market prices the surplus would have been approximately \$100,000 greater."

**Dividends.**—The Hall Signal Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock and a dividend of ¼ per cent. on the common.

The Tennessee Coal, Iron & Railroad Company has declared a quarterly dividend of 1 per cent. on the common stock and 2 per cent. on the preferred stock, payable February 1.

The regular semiannual dividend of 3 per cent. on the preferred stock of the Alabama Steel & Shipbuilding Company, guaranteed by the Tennessee Coal, Iron & Railroad Company will be paid January 2.

The American Locomotive Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable January 21.

Manning, Maxwell & Moore, Incorporated, has declared

the regular quarterly dividend of 1½ per cent., payable December 31.

The New York Air Brake Company has declared a quarterly dividend of 2½ per cent. on the common stock and 2 per cent. on the preferred stock, both payable January 1.

The American Seeding Machine Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock and 1 per cent. on the common stock, both payable January 15.

The E. W. Bliss Company has declared a quarterly dividend of 2½ per cent. on the common stock and 2 per cent. on the preferred stock, both payable January 1.

The Riehle Bros. Testing Machine Company has declared an annual dividend of 6 per cent., payable January 1.

The Central Coal & Coke Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock and 1½ per cent. on the common stock, payable January 15.

The Union Switch & Signal Company, Pittsburgh, has declared a quarterly dividend of 3 per cent. on the common stock, and a quarterly dividend of the same amount on the preferred stock. This places the common stock on a 12 per cent. basis, as against 8 per cent. heretofore, and places the preferred on a 12 per cent. basis, as against 10 per cent. heretofore. The dividends are both payable January 10.

The Westinghouse Machine Company, Pittsburgh, has declared a quarterly dividend of 2½ per cent., payable January 10. At a special meeting of stockholders held in East Pittsburgh, Pa., recently. It was unanimously voted to accept the proposition for the acquirement of the entire capital stock of the Nernst Company. This action is in pursuance of a policy of Mr. Westinghouse to concentrate his enterprises as much as possible, and to thus simplify the management of a constantly expanding business.

### Labor Notes.

The readjustment of wages of puddlers and other helpers on a basis of \$4.50 has been completed in most of the mills in eastern Pennsylvania, the Harrisburg mills having announced the change last week.

The strike of the General Electric Company's Schenectady, N. Y., works, which began December 2 and caused the idleness of over 2000 men, was settled on December 20. The strikers waived the demand which caused the strike—namely, for the reinstatement of three discharged draftsmen.

In a conference at Springfield, December 11, Massachusetts labor leaders expressed themselves to the State Commissioners of Industrial Education as bitterly opposed to technical schools. The argument against technical schools was that they taught in a six months' course all that an apprentice at a trade would acquire in several years under union rules. The business agent of the Plumbers' Union stated that the Springfield Technical High School was responsible for the loss of the plumbers' strike a year ago. The school furnished a sufficient number of plumbers to enable the contractors to execute urgent commissions, which overturned the plans of the strikers, who had counted on the absolute inability of the master plumbers to procure competent help. The president of the Central Labor Union and the business agents of the painters', plumbers', barbers', carpenters' and tool makers' unions agreed that the working man had much to lose and nothing to gain through technical schools maintained by the city or State.

An advance of 10 per cent., effective January 1, will be made in the wages of the employees of the various plants of the Illinois Steel Company, Chicago. The notice posted at the mills states that common labor will be advanced 10 per cent. per day, and turn labor will be adjusted accordingly.

T. S. Anderson, Sheffield, England, writing to the London *Times Engineering Supplement* concerning a process of cutting iron and steel by a combination flame of oxy-hydrogen and pure oxygen, says that with installations he has made this method has been employed in cutting away "runners" and sinkheads from steel castings, some of portions cut away being 3 ft. thick. The dressing of armor plate and the cutting of boiler plates have been performed by the use of the process.

### Steam Turbines in the Navy.

WASHINGTON, D. C., December 24, 1906.—The increasing importance of the steam turbine from a naval point of view is reflected in the forthcoming annual report of Admiral C. W. Rae, chief of the Bureau of Steam Engineering of the Navy Department, through whose courtesy the correspondent of *The Iron Age* is enabled to present the abstract given below. Another interesting feature of the report describes the installation of a number of high power gasoline motors and the investigations that have been made with a view to reducing the weight of machinery per horsepower in engines of this type.

#### Development of Steam Turbines.

The rapid progress of the steam turbine elsewhere and its increasing application to marine propelling purposes, particularly by other countries (it being stated that the British Government has decided to install the turbine in all future war vessels), points to this as probably the most important engineering problem of the present day. It is a radical change, however, involving many new features, and the bureau has pursued a conservative course in connection with the turbine, preferring to wait before adopting it extensively until it had been demonstrated as unquestionably the best system of propulsion for naval purposes. At the same time tests and inspections have been made whenever the opportunity offered, and extensive investigations of the question have been carried on. It is believed that when the three scout cruisers now building (two with turbines and one with reciprocating engines) are completed and their trials have been held, comparative data of the utmost value will be obtained. For the purpose of securing further data in regard to turbine machinery and its operation, a representative of this bureau, under orders from the Department, visited a number of plants where turbines are manufactured and others where they are in daily operation. An officer of this bureau is at present abroad, making a thorough investigation of marine turbine installations that are in operation and in contemplation.

Last year the bureau asked estimates and designs from navy yards and outside firms for the purpose of deciding on a standard arrangement and type of machinery for 50-ft. launches. Of these designs there are now four types building, one each at the navy yards at Portsmouth, New York, Norfolk and Mare Island. That building at Portsmouth, to be fitted with steam turbines, is nearing completion, and when the comparative trials between the different types have been held that best suited to the requirements of the service can be selected as a standard.

#### Installation of Gasoline Motors.

The following gasoline motors have been installed during the year:

- One 25-hp. Standard, four-cylinder, express type.
- One 12-hp. Standard, three-cylinder, for a 20-ft. boat for torpedo boat destroyers.
- One 10-hp. Jaeger motor, installed in the 28-ft. whaleboat recently assigned to the Maine.
- One 300-hp. six-cylinder motor for the 60-ft. Indian Head boat. This boat is in use between Washington and Indian Head.
- One 300-hp. Standard, six-cylinder, for a ferryboat at the navy yard, Portsmouth, N. H.
- A 75-hp. Brownell & Triebert motor is soon to be installed in a 40-ft. barge built at the Norfolk Navy Yard.

Investigation has also been made along the line of the double acting gasoline motors now building by the Standard Motor Construction Company, in which the weight of machinery per horsepower has been considerably reduced.

The designing of motors for naval use has been nearly completed for small four-cylinder engines for boats of the 20-ft. type, with a two-cylinder unit of 8 hp., which can be added to for larger boats. These boats are intended for destroyers and collier service.

#### Experiment Station at Annapolis.

One of the most important undertaking of the bureau in recent years has been the establishment of an experiment station at Annapolis, Md., for the testing of motors, machinery, materials, &c.

The Government having acquired a clear title to the

land selected for the site, a contract was made for the construction of the foundations for the first building, and the work has proceeded without interruption and is now nearly completed. Bids for the erection of the superstructure were opened on October 15, and, if satisfactory, the work can go on with only such delays as may be caused by winter weather.

Pending the completion of this building an experimental boiler has been installed in one of the old buildings of the Naval Academy and the work of erecting the experimental marine turbine engines, condensers, pumps, &c., is proceeded with by the aid of skilled mechanics provided by the last appropriation bill. It is expected that the tests and experiments made with these turbines will afford considerable valuable data for use of the bureau in connection with the designing of turbine installations for naval vessels. The operation of the turbines will also afford useful practical instruction to midshipmen and mechanics prior to the detail of the latter to ships fitted with such machinery.

#### Inspection of Engineering Material.

The bureau during the past year has added greatly to the efficiency of its staff of inspectors of engineering material by availing itself of the service of retired officers of the navy, the object being to prevent delays in inspection, which are often seized upon by contractors as an excuse for immunity from a just penalty for delay in the delivery of material contracted for. In this connection the bureau publishes a list of the various inspection districts in which naval inspectors are located, whose services are at all times available for the inspection of material purchased by the Government from private contractors. The headquarters of the various inspection districts are as follows: Homestead Steel Works, Munhall, Pa.; Midvale Steel Works, Nicetown, Philadelphia, Pa.; Bethlehem Steel Company, South Bethlehem, Pa.; American Steel Castings Company, Chester, Pa.; Harrisburgh, Pa., room 21, Post Office Building; Brooklyn, N. Y., room 5, Post Office Building; Hartford, Conn., room 1, Post Office Building; Shelby, Ohio; Boston, Mass., rooms 518 and 519, Beacon Building. In addition to the inspection work done in the regular inspection districts a large amount of material is inspected by officers detailed as naval inspectors of machinery, when such material is manufactured in the near vicinity of their stations. This is notably the case with the naval inspectors of machinery at the works of the Fore River Shipbuilding Company, Quincy, Mass., and the Bath Iron Works, Bath, Me.

W. L. C.

#### New Belt Line and Freight Terminals at Buffalo.—

The Buffalo, Lake Erie & Niagara Railroad Company has been granted permission by the Railroad Commission of the State of New York to construct a freight terminal belt line around the city of Buffalo, extending from Bay View, on Lake Erie—a short distance west of the Lackawanna Steel Company's plant—bordering the southern, eastern and northern limits of the city to Niagara River, a short distance south of Tonawanda, thence running south along the Niagara River to the International Bridge. The length of the line will be 26½ miles, with branches aggregating 12 miles additional. One of the principal objects of the new company will be to provide manufacturing sites having railroad connection with all lines and to care for the industrial expansion now taking place in Buffalo. A breakwater and extensive wharves and terminals will be constructed at Bay View at a cost of over \$2,000,000, and dockage and terminal facilities will also be provided on the Niagara River at the northern end of the line. The cost of the entire line, with terminals, will approximate \$8,000,000. Construction work is to be begun at once.

**Additional Lackawanna Coal Property.**—The Lackawanna Steel Company has acquired the J. W. Ellsworth coal properties in Washington County, Pennsylvania. The purchase was made to provide the steel company with an adequate supply of coking and gas coal. The details have not been arranged as yet, and it will be some time before the Ellsworth coal will be used in any quantity.



## The Machinery Trade.

NEW YORK, December 26, 1906.

While no large orders for machinery were placed during the week, the inquiries were such as to indicate a rush of business after the holidays and the absence of heavy trading is only what might be expected at this time. It was with future business that machinery men were concerning themselves principally and they had plenty of it under consideration. It is a known fact that a large demand for power machinery is followed by increased requests for bids on general machinery, and this week the power men have before them specifications covering a great deal of work. It is said among the leading dealers in the engine and boiler trade that they have never before experienced such a demand for equipment, and the business pending exceeds all records. One leading engine man made comparisons of the inquiries pending at the close of the last three years, and he declared that the number of big power propositions to be closed out early in the new year will be far in excess of any former year. There is talk in the trade about the high speed engine men getting together and following the move of the Corliss engine manufacturers in forming an association for mutual benefit. It is possible that the new year will see the plan carried out.

The International Steam Pump Company has announced that the advance in the cost of raw materials has caused a general raise in prices of its products, and customers have been requested to ask for new quotations in ordering.

### Society of Corliss Engine Manufacturers Organized.

At a meeting of the Corliss engine builders of the country, held in Philadelphia, Pa., a few days ago, an organization to be known as the Society of Corliss Engine Manufacturers of America was formed. The society was organized for the promotion of the building of Corliss engines of a better quality and of more uniform specification and design, the co-operation among its members to secure the most economical means of manufacturing such engines, the promotion of good fellowship among its members, and the promulgation and circulation of such literature referring to the design, manufacture and operation of Corliss engines as will be beneficial to the trade and instructive to the purchaser generally. The Corliss engine builders have found that they have been considerably hampered in making bids on specifications submitted to them for engines because of the lack of uniformity in the engine specifications of the average engineer. Consequently, the builders decided that instead of accepting specifications laid down by purchasers they would build engines according to their own specifications, and arrangements will be made for making uniform specifications, the terms for which will be agreed upon by all the companies interested in the movement. It was pointed out that in many instances bidders found it impossible to conform with some of the rules laid down by engineers and purchasers at a price that would be fair to all parties, and the argument will be used that it is much better for the purchaser to buy according to designs laid out by the engine builders themselves. The question of erecting engines at the buyers' plants was also discussed and plans were made toward arranging changes for that work. It has been found that in some cases engine builders in remote sections from where the order is being placed have been handicapped because of the demands made upon them for an erecting force, and it is proposed to arrange a schedule by which all the builders will have a fair chance in that part of the estimating.

The meeting was well attended by representative engine builders, and there is no doubt that much benefit will be gained by the organization of the association as it will give the builders a chance to become more intimately acquainted and a better opportunity to discuss questions affecting their interests. At the meeting J. J. Record, president of the Minneapolis Steel & Foundry Company, Minneapolis, Minn., was elected president; W. E. Dodds, general manager of the Allis-Chalmers Company, Milwaukee, Wis., and Gardner C. Simms, president of the William A. Harris Steam Engine Company, Providence, R. I., vice-presidents; J. C. Hooven, president of the Hooven-Owens, Rentschler Company, Hamilton, Ohio, treasurer. The Board of Directors consists of the officers and F. L. Failchild, of the C. & T. Cooper Company, Mt. Vernon, Ohio; James Brooks, president of the Southwark Foundry & Machine Company, Philadelphia, Pa., and L. W. O'Neil, of the Fulton Iron Works, St. Louis, Mo.

### The Machinery Trade Concentration.

A communication is being sent to machinery men throughout the country by a committee selected by F. H. Stillman, president of the Watson-Stillman Company, asking the recipients for their opinion on the proposition to concentrate the machinery trade as far as possible under one roof in the Fulton Building of the Hudson Companies terminal on Church street, New York. The communication, in addition

to asking for an opinion as regards the plan, asks whether the company to which it is addressed has a New York office; whether it favors establishing a warehouse on the Jersey shore for the purpose of exhibiting and storing machinery, and also asks how much space the company in question would use for office purposes, and in the event of a storage warehouse being built what space would be required in such a building. The men forming the committee and the companies they represent are the American Locomotive Company, Leigh Best, vice-president; Ingersoll-Rand Company, W. L. Saunders, president; Morris Machine Works, C. A. Hungerford; Prevert Machinery Company, H. F. Frevert; Prentiss Tool & Supply Company, H. Prentiss, president; Railway Steel Spring Company, J. E. French, chairman; Hooven-Owens, Rentschler Company, John S. Wright, eastern manager; Franklin Boiler Works Company, H. C. Van Zile, president, and the Watson-Stillman Company, F. H. Stillman, president. The secretary of the committee is Theodore Waters and communications replying to the inquiry are to be sent to him at 62 Cedar street, New York. It is the plan of those forming the committee to get the general sentiment as far as possible on the movement and if they meet any material encouragement they will later call a meeting of the parties interested to discuss the proposition and in addition take up the question of forming a machinery club which will have quarters in the Fulton Building. It is explained that the Hudson Companies are holding the Fulton Building in reserve for the trade, and because of the demand for rentals it is announced that action must be taken shortly.

### Pennsylvania Railroad's Proposed Power Plant.

Although the plans for the power house and terminal to be erected by the Pennsylvania Railroad at Harrison, N. J., have not been entirely passed upon, it is understood that there are some inquiries in the trade along certain lines for its equipment, and it will not be long before the buying will be begun. It is very probable that this will be one of the first big power jobs to be closed during the new year in this vicinity, and it will be a record breaking one from all accounts. Judging from what is being said in the trade about the project, the engineers who have the details under consideration are planning something very large in the way of boilers, but no figures have been asked for as yet. It is proposed to develop, from all accounts, about 75,000 hp., and the plant will furnish power for the company's proposed electric trains through its tunnel under the Hudson River. Judging from the power equipment that is being talked of, it is highly probable that the company's electrical zone will extend from a distance beyond Elizabeth, eventually. It is understood that in addition to the power plant it is proposed to erect a terminal station at Harrison with freight handling facilities as well as a car repair plant, round house, blacksmith shop and a general construction plant. It is understood when the details are eventually carried out the plant will be one of the largest of its kind in the East. In addition to the big order for power equipment, the machine tool trade can look forward to some good business in that line and there will be needed a large general assortment of machinery for the blacksmith work, the wood work on railroad coaches and the like.

The General Electric Company has been placing some orders for heavy equipment for its new addition at Schenectady, N. Y. The company is building an addition to its turbine department about 150 x 800 ft., and although work of placing orders for machinery was begun some time ago there is from all accounts some business still to be let. Some orders were placed last week for heavy crane equipment and like apparatus, and it is understood that the company's engineers are trying to arrange to begin the new year with all machinery for that plant arranged for.

The Buffalo Brake Beam Company, 130 Pine street, New York, manufacturer of brake beams for railroad cars and various other railroad appliances, has purchased a 5-acre tract of land adjacent to the plant of the Lackawanna Steel Company in South Buffalo, N. Y., and arrangements are being made for the erection of a new plant which it is expected will be completed within two or three months. The company already has a large plant at Buffalo which will be abandoned upon the completion of the new plant. The plans call for a main structure, 80 x 300 ft., and this, it is understood, will enable the company to about quadruple its present output. No power house will be erected as the company has arranged to purchase electric power from another company. In addition to the main building there will be other structures connected with the plant which will be up to date in every respect and will be equipped with a modern assortment of tools. The machinery now used in the old plant on Chandler street is to be moved to the new building, but arrangements are being made by C. J. Bacher, resident manager of Buffalo, for considerable new equipment. A good assortment of machine tools will be installed but most of the machinery installed will be in the line of presses, of which a large assortment will be required, especially in the way of heavy equipment. S. A. Crone is president of the company and has his headquarters at the general office in New York. He is not attending, however, to the machinery

details, which are entirely in the hands of the Buffalo manager.

For a long time the trade has been closely following the United States Cast Iron Pipe & Foundry Company's improvements at Burlington, N. J., where during the past year two large foundries and a power plant have been built. The company is now figuring on a new machinestop but the time of its building has not been determined. The building will be of brick and steel and it is likely that it will be constructed in the early spring.

The Atlantic Insulating Wire & Cable Company, 120 Liberty street, New York, is having a new plant erected at Stamford, Conn., to take the place of its factory which was burned to the ground some time ago. The Ransome & Smith Company, contracting engineers, 11 Broadway, New York, is superintending the erection of the plant which consists of a main building, 80 x 350 ft., two stories in height, and a power house of sufficient size to accommodate a plant of 450 hp. An Allis-Chalmers engine will be installed and Heine boilers have been contracted for. The company expects to get in its new plant within three months and some rapid work has been done in arranging the engineering and machinery details. As the company's entire plant was wiped out by the flames, no manufacturing is being done at present, as it would take about as long to get a temporary plant going as it will to get the company's new plant in operation. Some time before the fire the company was talking of building a new plant. The plant now in course of construction will be of sufficient size to take care of the increased business for which it was designed to erect an additional plant to the one which was destroyed.

The plant of the Avoca Wheel Company, Avoca, N. Y., whose plant was completely destroyed by fire in the early part of November, is to be rebuilt by a company that is now being organized and which will resume the manufacture of wheels on as extensive a scale as was carried on before the fire. The complete arrangements have not yet been completed and plans for the new buildings have not been perfected. The plant will be erected on property which has been purchased and will be about 50 x 300 ft. It is the intention to begin construction as soon as the weather will permit and to equip the plant with the most modern machinery and appliances obtainable. The company will probably be incorporated and will be composed of John H. Ellis, H. Wilnot Smith, Warren H. Lee, Claude D. Carroll of Avoca and A. D. Saunders of Strafford, N. Y. The capital will be about \$75,000 and the new company will retain the name of the Avoca Wheel Company.

Lathes, drill presses, planers, &c., are required by the Hatfield Motor Vehicle Company, Cortland, N. Y., which was recently incorporated with a capital stock of \$50,000, to manufacture automobiles for pleasure and commercial use. The company has leased part of the Cortland Wagon Company's plant, and will have facilities for a large output. The directors include C. H. Pond, C. T. Vance, A. D. Van Dyke, C. B. Hatfield and C. B. Hatfield, Jr.

A new factory, 131 x 275 ft. two stories and basement, is to be built by the Hires-Turner Glass Company, Philadelphia, Pa., for the equipment of which the company anticipates expending \$10,000 on new machinery.

The plant to be erected at Washington, D. C., by the Carter Motor Car Corporation will be equipped with the latest and best machinery that can be procured, all of which will be operated by electric motors. The company will erect its own power plant and will install machinery for the manufacture of all parts of automobiles. When completed the plant will cover about five acres.

The Allentown Portland Cement Company, Allentown, Pa., recently incorporated with a capital stock of \$2,000,000, has secured valuable cement rock and lime stone property near Egypt, and in the spring will erect a modern Portland cement plant with a daily capacity of 4000 barrels. Dr. J. D. Erdman is president, C. D. Strauss, vice-president; Harvey E. Erdman secretary, and J. H. Bowman, treasurer, who with Edward H. Heim, C. H. Lawrence, superintendent, and John O. Bowman, constitute the Board of Directors.

The Virginia Portland Cement Company, Fordwick, Va., is about to add 2000 barrels per day capacity to its plant, which will be one of the largest cement plants in the South. Many improvements will be made in the buildings and machinery and there will be a new power house. In the power house two turbines are to be installed, and the boiler capacity, increased by 1500 hp., will aggregate 2000 hp. The whole of the old and new machinery will be driven by electricity. The consulting engineers of this plant are W. S. Barstow & Co., New York and Portland, Ore. Barstow & Co. have also been retained as consulting engineers for the new plant of the Seneca Button Company, at Poughkeepsie, N. Y., which is to be operated electrically throughout, and for the Bergen Point Chemical Works, Constable Hook, N. J., which is about to be equipped with a new light and power plant.

Superintendent Franchot, of the State Department of Public Works, Albany, N. Y., opened the following bids on December 19 for barge canal work: Contract No. 18, for the

construction of several bridges on both the Champlain and Erie canals; No. 17, construction of a dam in the Mohawk River at Amsterdam and Tribes Hill, with other work; No. 18, excavation in the vicinity of Castle Creek and Mindenville, Montgomery County. The lowest bidders with the engineers' estimates are as follows: Contract No. 18, the United Construction Company, Albany, N. Y., \$63,472.25, engineers' estimate, \$70,718.90; No. 17, the Scofield Company, Philadelphia, Pa., \$846,792.74, engineers' estimate, \$883,926; No. 18, the O'Brien & Hooligan Construction Company, Syracuse, N. Y., \$859,455, engineers' estimate, \$735,980. Thus far contracts have been let for work on the canal aggregating about \$20,000,000, plans for about \$18,000,000 worth of work have been completed, and plans involving the expenditure of \$12,000,000 more are far enough advanced to permit of their completion within the next three months. From this summary of the State engineer and surveyor it is evident that within the next few months additional contracts will be placed for a very large amount of work which will no doubt necessitate the purchase of considerable in the way of contractors' machinery. At this time 70 of the 440 miles of barge canal are under contract.

## Philadelphia Machinery Market.

PHILADELPHIA, PA., December 24, 1906.

Sales of machine tools as well as general machinery have been comparatively light during the past week. As was anticipated, the advent of the Christmas holidays, as well as the nearness of the year's end, has brought the machinery trade almost to a standstill, which condition will no doubt continue until after the turn of the year. There seems to be no inclination on the part of the buyer, or for that matter the seller, to take hold of business with any great degree of activity, except in cases where it is necessary to close up pending matters which for one reason or another must be included in the present year's business. There is, however, but little business of this character about, and the trade is rather shaping its plans for business to be taken up again in a more active manner after the holidays have passed.

Inquiries, considering the season of the year, are quite abundant, but do not lead up to business very promptly. The demand is confined largely to single tools and small lots for minor extensions. No propositions for any extensive equipment for 1907 have been presented, and are not expected until early in 1907. Builders of tools and machinery are fully occupied and plants continue in operation at their best capacity. This, however, will in many cases be considerably reduced owing to the holidays, as well as temporary shutdowns for stock taking purposes. Little improvement can therefore be expected in the way of deliveries, particularly during the early months of the year, and as manufacturers are booked so well ahead there would have to be quite a long period of inactivity to bring deliveries back into anything like normal conditions.

There has been little doing for foreign account. Inquiries for machine tools for export have been light, and no business of any importance is expected to be taken up the remainder of the year. Several orders for special tools have been booked, and those doing a more or less regularly established trade abroad report conditions about as usual for the season.

The demand for boilers and engines has been quiet, and not much business for immediate delivery is expected at the time. Several large propositions are under consideration for next year, but these will probably not be closed for several months. Trade in equipment of the smaller horsepower is dull, while dealers in second-hand boilers and engines report conditions about as usual at this season.

Second-hand machine tools are in somewhat better supply. Several of the local dealers, having recently purchased extensive equipments of plants, are now preparing to offer the tools for sale. There seems to be a growing inclination on the part of some of the local machine tool houses to go into the second-hand tool business, as with the distant deliveries on new tools they have found it imperative to do something for their customers who must have tools, of some kind at least, to serve their purpose until the new ones can be delivered. This has brought the merchant in closer touch with the second-hand tool business, and with it the tendency to engage in that business, if but temporarily.

Foundry conditions are unchanged. Both iron and steel foundries are running to their best capacities, making every effort to supply the demands of the trade. The tonnage offered is probably the largest in the history of the trade, and foundries have their order books well filled for castings of every character. Deliveries are becoming more distant instead of improving, and the scarcity of raw materials, as well as the uncertainty as to delivery of supplies already purchased, makes any improvement in the near future rather uncertain.

Ernest Koerting of Pegli, Italy, is having plans prepared



for a new plant to be equipped with the most modern machinery and appliances for the manufacture of the Koerting jet apparatus and special high pressure valves. This plant will, in all probability, be operated in connection with that of the Schutte & Koerting Company, Twelfth and Thompson streets, in this city, whose present facilities are not extensive enough for the peculiar requirements of the above business.

Barwood & Snider, machinery merchants, on the Bourne Machinery Floor, will on January 1 assume the sole representation for the line of antifriction chain hoists manufactured by the Chisholm & Moore Mfg. Company, Cleveland, Ohio, in the Philadelphia territory.

The Iroquois Iron Company, manufacturer of steam and road rollers, asphalt making machinery and commercial automobiles, whose plant is now located at Buffalo, N. Y., and whose offices are in the Land Title Building in this city, contemplates removing its plant to Eddystone, Pa. Plans and specifications for a large plant at the latter location are now in course of preparation.

Frank Toomey, second-hand machinery merchant, has purchased the entire equipment of several large machinery and power plants, and is now preparing to place quite a large additional list of tools from those plants before the trade. The demand for all classes of second-hand machinery and tools has been large, and some satisfactory sales have recently been made. Several large batteries of boilers have also been recently purchased by Mr. Toomey. There has been a good demand for boilers of the higher horse powers, and some kinds, notably those of the horizontal type, have been somewhat scarce.

The Parker Roller Company, Pennsylvania Building, reports the demand for its boilers very satisfactory. Inquiries have been good, and among the orders recently booked may be mentioned one for four 275 hp. for the Farmers' Feed Company, New York; one of 415 hp. for the Pittsburgh Reduction Company, Pittsburgh, Pa.; two of 209 hp. for the Fairmount Hotel Company, San Francisco, Cal., and two of 301 hp. for the St. Francis Hotel, Pittsburgh, Pa. Seven superheaters, five return tubular and two Parker boilers have also been sold the International Paper Company, South Gardner, Maine. The Parker Company has just completed the installation of 16 double end boilers, each of 800 hp., equipped with Roney stokers, for the Delaware Avenue power plant of the Philadelphia Rapid Transit Company, and has just finished installing the third order, consisting of four double end Parker boilers, with a total capacity of 2500 hp., in the power plant of the John B. Stetson Company, of this city.

## Chicago Machinery Market.

CHICAGO, ILL., December 24, 1906.

Current business has fallen off to a large extent, and dealers on "Machinery Row" are accumulating small stocks for the first time this year. The high prices quoted on all lines of tools, to some extent, has curtailed buying, although the approach of the end-year inventory period has deferred many purchases until after January 1. The outlook, however, is unusually bright and to other operations of magnitude has been added that of the Corn Products Refining Company, whose equipment purchases will involve an expenditure of fully \$2,000,000. Bids will also be called for in the near future by the Illinois Steel Company, for a 40,000,000-gal. pumping station to be erected at South Chicago, although with the exception of the Gary operation, noted last week, steel works improvements projected are only of minor importance.

The Corn Products Refining Company, Chicago, has acquired a site for the erection of its plant, on the south side of Sixty-third street, extending from Archer avenue west to the Chicago & Alton Railroad and the Drainage Canal. The tract is nearly a mile long and a quarter of a mile wide, and comprises about 110 acres. Plans for the buildings, 33 in number, are now being prepared, and they will be of varying sizes, depending upon the departments they will contain. The two refining buildings, which will be the largest in the group, will be 14 stories high, 200 ft. long and 150 ft. wide. The wet starch building will be eight stories high, 135 x 250 ft., and another will be six stories, 150 x 150 ft. Twelve of the structures will be four stories, 110 x 150 ft., with the exception of one which will be 300 ft. long. The warehouses will be built, two and three stories in height, 100 x 300 ft. The grain storage tanks will be of tile or concrete and will have a capacity of 1,000,000 bushels, and a storage building, similarly constructed, will hold 10,000 tons of gluten feed. The buildings up to four and five stories high will be constructed of reinforced concrete, with concrete roofs and wire glass set in metal window frames. Higher buildings will be designed to carry great loads and will be of steel construction. In addition to the manufacturing buildings a number of other factories will be included,

such as a cooper shop, can factory, paper-box plant and printing establishment. The power plant will be equipped with boilers of 12,000 hp. capacity and the electrical equipment will generate 8000 kw. A pumping plant with a capacity of 25,000,000 gal. in 24 hr. will provide the water supply, while the grinding capacity will be 50,000 bushels daily. On the bank of the Drainage Canal a warehouse 400 ft. long will be built to facilitate water shipments, and 20 miles of tracks and switches will connect the buildings with the six belt lines and seven trunk lines which will afford unequaled transportation facilities. Three hundred cars of freight will be handled daily. Contracts for the buildings and equipment will be awarded within a few months and work will be commenced about April 1. The plant is to be completed and will go into operation September 1, 1908. The company's works are now located in Chicago, Pekin, Ill.; Waukegan, Wis.; Granite City, Ill.; Indianapolis, Buffalo, Oswego, N. Y., and New York City. The Chicago plant will be abandoned and certain departments of other factories will be transferred to the new works. The entire operation, including the site, buildings and equipment, involves an expenditure of \$5,000,000.

To provide for future extensions the Davenport Locomotive Works, Davenport, Iowa, builder of light locomotives, has purchased a tract of 27 acres adjoining its plant, making a total of 40 acres available for enlargements. The company's immediate plans provide for the erection of the new foundry, 90 x 160 ft., the equipment for which has not yet been purchased. This will be the first building on the vacant tract, and as the company has already covered its original site with buildings future additions will be made on its adjoining property. The ultimate size of the new plant will depend entirely on new developments. Plans are now under way for increasing the capacity to two locomotives daily.

The Green Engineering Company, Chicago, manufacturer of chain grate stokers, has increased its capital from \$75,000 to \$200,000, the added capital being provided to cover the erection of the company's new plant at East Chicago, Ind. This plant, which has been under erection for some time and which is now operating at one-third of its ultimate capacity, comprises six buildings and is erected on a site of 8½ acres. The foundry is 200 ft. square, and the machine shop 150 x 350 ft. The other buildings include a power house, pattern shop, warehouse and office building. The old plant, which is located on the South Side of Chicago, will be dismantled as soon as the new one is in full operation.

The Senter Mfg. Company, Chattanooga, Tenn., has been organized with a capital of \$10,000 to engage in the manufacture of an automatic boiler feed and low water alarm and a recently patented pump governor. The feed water for both high and low pressure steam boilers is controlled by this automatic device without the use of a float valve, diaphragm or expansion pipe, the water in any steam or low water generator being automatically retained at a given point, inasmuch as it is replenished as rapidly as evaporated. T. N. Senter is president and John F. Senter vice-president and general manager.

The Indiana Union Traction Company has awarded contracts to Shepherdson & Hawkins for the erection of new shops at Anderson, Ind. The buildings will cover a three-acre tract adjoining the company's power house at that place. The buildings include erecting shop, 55 x 480 ft.; machine shop, 150 x 200 ft., two stories high; blacksmith shop, 60 x 140 ft.; and two other buildings, 80 x 112 ft., and 15 x 80 ft., respectively. Machinery and equipment purchases will shortly be made.

The Light and Power Commission of the City of Marquette, Mich., has decided on extensions and improvements to the municipal lighting plant, which will cost in the aggregate of \$67,000. The power generating capacity is to be increased from 1000 to 1500 hp., and additional boilers and generators will shortly be purchased.

Specifications for additional machinery to be installed in the Columbus, Ohio, municipal electric lighting plant have been prepared by M. M. Reid, superintendent, and bids are now being called for. The equipment includes one 1000-kw. turbine, one 1000-kw. generator, one 1000-kw. condenser with accessories, two 300-hp. water tube boilers, two automatic stokers and steel coal bins, two fuel economizers and additional switch board capacity.

The Elgin Merchants' Light Company, Elgin, Ill., has increased its capital from \$25,000 to \$50,000, the increased capital to provide for additions to its power generating capacity. The company is in the market for two turbine water wheels and a governor, one 125 hp. oil or producer gas engine with a generator of equal capacity. The ultimate capacity of the plant will be 500 hp., and additions will be made from time to time. Other central station supplies that are required to fit up a plant of this kind will also be purchased.

A gas producer plant in three units having a total capacity of 4500 hp. will be installed in the new plant of the Iola Portland Cement Company, Dallas, Texas, by the Power & Mining Machinery Company, Cudahy, Wis. Bituminous coal and Texas lignite will be the fuel used, the Loomis-Pettibone system, which will be installed, being adapted to

the use of either fuel without changes in the apparatus. The Snow Steam Pump Works, Buffalo, will furnish four single tandem double acting gas engines, with a normal capacity of 1100 b.h.p. each. They will be direct connected with a.c. 25 cycle electric generators of 810 kw. capacity each, and will operate in parallel. Continuous operation, 24 hr. per day, seven days a week, is required of the plant.

The Power & Mining Machinery Company, Cudahy, Wis., in conjunction with the Snow Steam Pump Works of Buffalo, N. Y., has opened a sales office at 719 White Building, Buffalo, where the sales of the several types of gas generating apparatus, such as the Loomis-Pettibone system, built by the Power & Mining Machinery Company, and gas engines built by the Snow Steam Pump Works, will be directed. Seward Babbitt, sales manager of the Power & Mining Machinery Company, will make his headquarters at this office on account of the facilities afforded for conducting business from that point.

**Catalogues Wanted.**—The Monroe Wire Works, Limited, Winnipeg, Manitoba, would like to receive catalogues from manufacturers of wire machinery, fence looms, and machinery for working wire into finished products.

## Cincinnati Machinery Market.

CINCINNATI, OHIO, December 24, 1906.

All the shops continue to show unprecedented prosperity. Quite a number of the larger concerns are devoting much thought as to the best way to increase their output, which is a very serious problem, as available contiguous ground in many instances is not to be had, and the only solution of the matter is utilizing every foot of floor space, even though tools are crowded a little closer than desirable. The expansion along this latter line throughout the past year has been marvelous and it is questionable if there is a single exception to be found in the various plants of this city and vicinity. The splendid condition of the shops already in operation has had the effect of causing a number of new ones to spring up, mostly along the line of standard tools.

The Kern Machine Tool Company, Cincinnati, has been incorporated with a capital stock of \$50,000, by Philip Fosdick, L. H. Fosdick, W. P. Burtner, Jr., C. F. Kern and John H. Clermont. Clifford F. Kern, who for the past 10 years has been connected with the firm of Julius Uilein & Co., will be president, and Philip Fosdick vice-president. Mr. Fosdick is well known in machine tool circles, having been up to within a year connected with the plant that bears his name, beside being president of the Cincinnati Board of Control and interested in a gear works' plant on Sixth street. A building is now being erected at Spring Grove and Station avenues and Winton place, which will be two stories high, 50 x 150 ft. The company has purchased the upright drill business formerly conducted by the American Tool Works Company and will in addition to this manufacture the Streit pulley lathe. It is understood that most of the machinery has already been purchased, and it is expected everything will be in readiness for operations some time during January. The company requests that all machine tool builders send catalogues of their tools to President Fosdick, 1207 Mercantile Library Building, Cincinnati, Ohio.

The American Tool Works Company will in the future devote its entire effort to the manufacture of lathes, planers, shapers and radial drills. Considerable new machinery is being installed and the output of the plant will be materially increased. This company formerly operated its plant on leased ground, but recently purchased the entire tract 180 ft. on Eggleston avenue and 200 ft. on Culvert street.

The William E. Gang Company, manufacturer of patent radial drills at 1543-1547 Queen City avenue, is making extensive improvements to its present plant which will give it about 3500 sq. ft. additional floor space.

The Sidney Steel Scraper Company, Sidney, Ohio, is making some extensive additions to its present plant, consisting of one building of brick, three stories high, 120 x 125 ft., one building 50 x 116 ft., one story, for blacksmith shop, and an office building. This latter building when completed will allow the use of the present structure for manufacturing purposes. An entire new electric power plant will be installed, with individual motors for operating the different machines. These improvements when complete will provide for over 60 per cent. additional capacity. The company is now operating with a day and night shift.

The Toledo Nut Lock Company, Toledo, has been incorporated with a capital stock of \$60,000, by Edw. M. Gale, Benj. Tanner, Mary C. Smith, R. B. Wilson and W. E. Brown.

The Royal Motor Car Company, Cleveland, Ohio, finding that its present location is utterly inadequate for the production of its cars, has purchased a large tract of land on Gordon Park boulevard, at the St. Clair street entrance to Gordon Park, and will immediately erect thereon a modern plant. The company was recently reincorporated with a capital stock of \$500,000, and includes among its stock-

holders many of the city's most prominent business men. Starting a few short years ago in a small factory, and employing about 30 men, it now finds need for over 500 skilled workmen. The company expects to have the new factory running before June 1, 1907.

## New England Machinery Market.

WORCESTER, MASS., December 24, 1906.

Inquiries have fallen off during the past week, which was inevitable in the face of the Christmas holidays, and manufacturers and dealers expect this condition to continue until after the New Year. Monday being wedged in between Sunday and Christmas counted for little in all lines of business, and the day after a holiday is usually not worth its full working value. By the end of another week business should be back to its normal condition, and dealers and manufacturers expect to see a great volume of business begin.

It is noticeable that an unusual number of manufacturers are disregarding the cold weather in beginning new building, and the winter record in this respect will undoubtedly be the largest that New England has ever seen.

As the time approaches when the dealers will close their books for the year they know that the totals will be the greatest they have ever reached, not in a small increase over previous records, but in a big way. It is estimated that the growth has been from 50 to 100 per cent. over 1905, and correspondingly greater, taking conditions of business into consideration, over other years. These figures, however, are based on orders taken, not on deliveries. Yet, taking sales actually consummated by delivery of machinery to customers, the record of 1906 is the largest known, probably with every dealer in New England, and certainly with every dealer in Boston.

There is a marked increase in the number of machine shops which are running nights, some of them with two complete shifts, but more availing themselves of every opportunity to work overtime. Shop forces have become better organized under the new conditions which necessitated the straining of every energy to produce work, and manufacturers find it easier to use night shifts now that larger forces of men have been trained. A favorite form of night work is to keep certain machines running, thus effecting a balance of production of the several departments of the works. One machine tool builder is operating his planers nights because his planer equipment is not adequate to keep up with the product of other machine tools. From the talk that one hears among the manufacturers it is probable that night work will increase in volume as the weeks go on.

A large number of manufacturing establishments, including many machine shops, shut down Monday, giving employees a little holiday. But the day was not entirely lost in some works, the opportunity being taken to make certain repairs and rearrangements.

The City Plate Ice Company, Hartford, Conn., has taken a 20 years' lease of land in that city, and will erect a plant for the manufacture of artificial ice. The company will be in the market for engine, boilers, compressors and ice manufacturing apparatus, but is not yet ready to receive bids.

An industrial enterprise, which if carried out will mean purchases of power equipment and general mill fixtures, is a very large pulp mill project for Quebec, which is being planned by members of the syndicate which controls the Berlin, N. H., paper mills. According to the report which comes from Quebec the plant will call for the expenditure of \$3,000,000.

The Moore Drop Forging Company, Springfield, Mass., whose plant at Brightwood was partially destroyed by fire recently, states that plans have been made for rebuilding the machine shop as it was before the fire, and the replacing of the drop shop by a steel building. It is expected that the plant will be running again in about three weeks.

Hill, Clarke & Co., Incorporated, Boston, is occupying its new offices in its store at Oliver and Purchase streets. The rooms are on the Purchase street side, vacating the corner windows, which will be used for display purposes. The finish is in handsome dark finished quartered oak, the scheme of which is carried out in the desks and other furnishings. An elaborate system of cabinets for filing purposes has been installed, and in fact every convenience is present. Broad windows afford a general view from the office over the store floor.

A new garbage plant, to cost \$150,000, is to be established at Fort Hill Wharf, Boston, to alleviate a nuisance created by the use of the wharf as a sorting place for the city's garbage. Plans for the plant have been prepared by Arthur N. Pierson, sanitary engineer, New York, and it is understood that the State Board of Health and protesting petitioners are willing to accept this solution of the problem. It is not yet announced what corporation is back of this enterprise, but it is said to be either the New England Sanitary Product Company or the City Refuse Utilization Company, both of which have a hand in the disposal of the city's garbage.



Springfield, Mass., is much interested in the findings of the Army Board of Review, which has decided to report favorably to Congress on the plan to make navigable the Connecticut River from Hartford to Springfield, recommending the expenditure of \$1,465,000 for the purpose. This includes, however, only the cost of actual work, nothing being provided for the purchase of existing rights, the board stating that if such purchases were necessary the cost would be out of proportion to the benefits. The plan is to extend the canal of the Connecticut River Improvement Company, which provides Windsor Locks, Conn., with power. It is apparent that a very serious obstacle to the fulfillment of the plan exists in the provision that no damages could be awarded the Improvement Company for loss of a certain value to its property. Springfield would be greatly benefited by the opening of navigation, especially in that it would be given a continuous water route to Long Island Sound and points beyond, making an important reduction in certain classes of freights, notably coal.

### Government Purchases.

WASHINGTON, D. C., December 24, 1906.

The Isthmian Canal Commission will soon ask bids for one 36-in. engine lathe.

R. B. Custer, superintendent of the United States Indian School, Albuquerque, New Mexico, will soon ask bids for one triplex pump direct connected to 10 hp. motor, one horizontal centrifugal pump belted to 5 hp. motor, and other supplies.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until January 22 for a motor, drilling machine, steam pumps, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 5 for six water tube boilers, lathes, steam hammer and bar straightening press for the Portsmouth, Boston and New York navy yards.

The Isthmian Canal Commission will receive bids until January 3, Circular No. 344, for boilers and other supplies.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until February 5 for one jib crane, water tube boilers, lathes and drill press for the Mare Island navy yard.

The Bureau of Supplies and Accounts Navy Department, Washington, will receive bids until January 22 for two hoisting engines and 25 self-dumping steel cable cars for the New York navy yard.

The following bids were opened December 18, for supplies for the navy yards:

Bidder 4, The Atlantic Works, Philadelphia, Pa.; 5, American Hoist & Derrick Company, St. Paul, Minn.; 10, George F. Blake Mfg. Company, New York; 24, F. S. Banks & Company, New York; 27, Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 28, Brown & Sharpe Mfg. Company, Providence, R. I.; 33, Cleveland Pneumatic Tool Company, Cleveland, Ohio; 39, James Clark, Jr., & Company, Somerville, Ky.; 40, Chicago Pneumatic Tool Company, New York; 50, Fairbanks Company, Baltimore, Md.; 60, Fox Machine Company, Grand Rapids, Mich.; 62, R. W. Geldart, New York; 66, G. & W. Mfg. Company, New York; 68, Garvin Machine Company, New York; 71, General Electric Company, Schenectady, N. Y.; 77, Hoshier-Platt Company, New York; 81, Holtzer-Cabot Electric Company, Brooklyn, N. Y.; 83, Hisey-Wolf Machine Company, Cincinnati, Ohio; 87, Hendy Machine Company, Torrington, Conn.; 90, Handlan-Buck Mfg. Company, Philadelphia, Pa.; 92, Independent Pneumatic Tool Company, Chicago, Ill.; 93, Ingersoll-Rand Company, New York; 107, Lenher Engineering Company, New York; 109, Manning, Maxwell & Moore, New York; 111, Motley, Green & Company, New York; 114, Manhattan Supply Company, New York; 115, Montgomery & Company, New York; 120, Mead-Morrison Mfg. Company, Cambridge, Mass.; 121, Marine Mfg. & Supply Company, New York; 127, National Electrical Supply Company, Washington, D. C.; 133, Niles-Bement-Pond Company, New York; 134, Northern Electrical Mfg. Company, Madison, Wis.; 137, Oliver Machinery Company, Grand Rapids, Mich.; 141, Pneumatic Appliance Company, New York; 145, Prentiss Tool & Supply Company, New York; 146, Pittsburgh Industrial Iron Works, Pittsburgh, Pa.; 150, John B. Roache, Brooklyn, N. Y.; 165, Sherman-Brown-Clements Company, New York; 173, Stroudsburg Engine Company, Stroudsburg, Pa.; 178, Smith-Courtney Company, Richmond, Va.; 182, Wm. L. Sargent, Fitchburg, Mass.; 189, Vandeyck Churchill Company, New York; 190, Vermilye & Power, New York; 196, Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.; 201, Williamson Bros. Company, Philadelphia, Pa.; 202, Ernst Wiener Company, New York; 208, Bigelow & Dowse Company, Boston; 211, Wm. Cramp & Son Ship & Engine Building Company, Philadelphia, Pa.; 222, Lidgerwood Mfg. Company, New York.

#### Schedule No. 265.

Class 1, one wood planing machine with knives—Bidder 90, \$1900.

Class 2, two Lidgerwood hoisting machines—Bidder 5, \$1848; 66, \$1598; 107, \$1574; 111, \$1777; 146, \$1681; 173, \$1475; 190, \$1736.50; 201, \$1673; 222, \$1750.

#### Schedule No. 266.

Class 11, one improved engine lathe—Bidder 100, \$935; 133, \$884 and \$964.

Class 12, one cold metal sawing machine—Bidder 133, \$935; 189, \$524.

Class 13, one double end lathe—Bidder 60, \$175; 90, \$337; 137, \$257; 145, \$175.

#### Schedule No. 267.

Class 21, one lathe—Bidder 59, \$820; 87, \$830; 109, \$830; 133, \$762; 178, \$830.

Class 22, one toolroom lathe—Bidder 59, \$998; 87, \$890; 109, \$890 and \$594; 133, \$794 and \$936; 178, \$890.

#### Schedule No. 268.

Class 31, one turret track turning and boring machine—Bidder 182, \$4638; 211, \$4335.

Class 32, one portable deck planer—Bidder 4, \$550.

#### Schedule No. 269.

Class 41, one plain milling machine—Bidder 27, \$1050; 28, \$1022 and \$985; 68, \$1280; 109, \$1150; 133, \$1093 and \$1218; 145, \$1080.

Class 42, four motor driven water tool grinders—Bidder 90, \$1080; 133, \$1080; 145, \$1200.

Class 43, two electrically driven water tool grinders—Bidder 30, \$423.

#### Schedule No. 278.

Class 113, one motor—Bidder 71, \$407; 134, \$468; 196, \$408.

#### Schedule No. 290.

Class 191, four motors—Bidder 71, \$112; 81, \$112.20; 127, \$107.

#### Schedule No. 291.

Class 215, two nonreversible air drills—Bidder 40, \$240; 92, \$293.70.

Class 222, two portable electric grinders—Bidder 62, \$147; 83, \$147; 109, \$147; 114, \$147; 115, \$147; 121, \$398.20; 127, \$139.70, \$140; 150, \$147; 165, \$147.

#### Schedule No. 293.

Class 283, four pneumatic drills and eight pneumatic hammers—Bidder 33, \$663; 40, \$590 and \$520; 92, \$536.60; 93, \$731 and \$781; 141, \$660.

Class 284, two duplex lever screw punches and two lighting portable punches—Bidder 115, \$134; 208, \$126.

Class 285, two horizontal simplex boiler feed pumps—Bidder 19, \$144; 24, \$94.80; 127, \$100.

The following bids were opened December 17, Circular No. 342, for supplies for the Isthmian Canal Commission:

Bidder 5, F. S. Banks & Company, New York; 23, Cuyler & Mohler, Baltimore, Md.; 25, D'Olier Engineering Company, Philadelphia, Pa.; 32, Fox Bros., New York; 33, Gardner Governor Company, Quincy, Ill.; 57, John H. McGowen Company, Cincinnati, Ohio; 59, Manning, Maxwell & Moore, New York; 67, National Electric Supply Company, Washington, D. C.; 79, Platt Iron Works Company, Dayton, Ohio; 103, Vermilye & Power, New York; 107, Henry R. Worthington, New York.

Class 7, Twelve duplex pumps. Bidder 5, \$2,740.80, 70 days; 23, \$2,937, 40 days; 25, \$6,600, 50 days; 32, \$2,734.80, 55 days; 33, \$3,330, 30 days from factory; 57, \$3,078, 6 weeks from factory; 59, \$3,235.86, 60 days; 67, \$2,030, 60 days; 79, \$3,173.40; 103, \$2,697, 40 days; 107, \$2,856.18, \$2,758.26.

The following bids were opened December 6 for supplies for the Isthmian Canal Commission, Circular No. 341:

Bidder 4, F. S. Banks & Co., New York; 9, The Chicago Pneumatic Tool Company, New York; 11, The Cleveland Pneumatic Tool Company, Cleveland, O.; 13, Cuyler & Mohler, Baltimore, Md.; 14, The Thomas H. Dallett Company, Philadelphia, Pa.; 20, The Fairbanks Company, New York; 21, Fox Bros. & Co., New York; 23, The Handlan-Buck Mfg. Company, St. Louis, Mo.; 24, The Ingersoll-Rand Company, New York; 30, Manning, Maxwell & Moore, New York; 31, Motley, Green & Co., New York; 33, The Prentiss Tool & Supply Company, New York; 35, Russell & Co., Massillon, O.; 38, The Sprague Electric Company, New York; 39, The Starr Drilling Machine Company, Akron, O.; 43, The Sullivan Machinery Company, Chicago, Ill.; 44, Vermilye & Power, New York; 46, The George D. Whitcomb Company, Chicago, Ill.; 47, The Laidlaw, Dunn, Gordon Company, New York; 51, The Austin Mfg. Company, Chicago, Ill.; 53, The Oil Well Supply Company, Pittsburgh, Pa.

Class 1, Rock drills, air hose, drill steel, parts for drills, &c.—Bidder 9, \$2020.25, 60 days, \$2810, 30 days; 11, except items 7, 8, 9, 13, 16, 18, 19 and 20, \$3011.25, 90 days; 14, except items 7, 8, 9, 18, 19, 20 and 21, \$3572, 90 days; 24, \$3704.25, 30 days; 31, except items 7, 8, 9, 14, 16 and 20, \$4431.25, 21 days; 34, item 2 only, \$400; 38, item 2 only, \$441.25, \$683.75, 30 days; 43, \$3703.50, 60 days; 46,

\$2262.75, 60 days; 47, except items 9, 18 and 21, \$3407.75, 60 days; 55, item 2 only \$356.25, 10 days.

Class 2. Rock drills, drill steel, parts for drills, &c.—Bidder 9, \$22,835.70, 135 days; 24, \$21,593.30, 45 days, \$21,927.03; 34, items 29 and 30 only, \$1650; 38, items 29 and 30, \$2025 and \$3400, 30 days; 43, except items 39, 53, 57, 77, 85, 89, 95 and 96, \$22,835.40, 60 days, item 29, \$1012, item 30, \$1012; 47, except items 39, 48, 62, 63, 64, 66, 67, 73, 74, 80, 81 and 96, \$15,750.71, 60 days; 55, items 29 and 30 only, \$2012.50, 10 days.

Class 3. Steam rock drills, drill parts, &c.—Bidder 9, \$7595.50, 60 days; 24, \$7399.63, 45 days, \$7042.53, 45 days; 34, item 105, \$900; 38, item 105, \$893.75, 30 days, \$1525; 43, except items 118, 121, 130, 136, 157 and 166, \$7462.40, 60 days; alternate item 105, \$892.50, item 111, \$81.25; 47, except items 130, 131, 132, 134, 135, 136, 150, 154 and 167, \$5587, 60 days; 55, item 105 only, \$1050, 10 days; 56, \$6569.49, 90 days.

Class 7. One engine complete with parts for Star drill—Bidder 35, \$1001.50, 70 days; 39, \$181.50, 56 days; 53, \$181.50, 60 days.

Class 8. Two engines with parts for Austin well drill—Bidder 35, \$1961.30, 70 days; 51, \$417, 75 days.

Class 10. One pipe cutting and threading machine—Bidder 4, \$864.95, 30 days; 13, \$931, 45 days; 20, \$894.50 and \$991.50, Colon, 15 days; 21, \$922.79, 21 days; 23, \$1032.08, 30 days; 30, \$944.71, 30 days; 33, \$950, 5 days; 41, \$1100, 30 days; 44, \$1164.90, 15 days.

Class 7 has been awarded to bidder 39; class 8 to bidder 51, and class 10 to bidder 4.

The following bids were opened December 11 for two suction dredges for the Isthmian Canal Commission, circular No. 338:

The Bay & River Dredging Company, San Francisco, Cal., delivery La Boca, \$198,910; time, 340 days.

The International Contract Company, Seattle, Wash., delivery La Boca, \$195,000; time, 180 days. Alternate on own plans and specifications, \$155,000; delivery, 180 days.

The Maryland Steel Company, Sparrows Point, Md., delivery Cristobal, \$127,750; time, 305 days. Alternate delivery Sparrows Point, Md., \$118,750; time, 365 days. Alternate delivery Cristobal, \$228,850; time, 365 days.

The R. G. Packard Company, New York, delivery Cristobal, \$189,000; time, 455 days.

The Pusey & Jones Company, Wilmington, Del., delivery Cristobal, \$175,477; time, 364 days. Alternate delivery La Boca, \$219,755; time, 364 days.

The Newport News Ship Building & Dry Dock Company, Newport News, Va., delivery Newport News, Va., \$107,000; time, 270 days. Alternate delivery Newport News, \$209,000; time, 309 days.

The following bids were opened December 6 for a new steam hammer for Tompkinsville:

Manning, Maxwell & Moore, New York, \$1,200; McDougall & Potter Company, New York, \$1,215, accepted; James Beggs & Co., New York, \$1,215.

The following awards have been made for supplies for the navy yards, bids for which were opened December 11.

Henshaw, Bulkeley & Co., San Francisco, Cal., class 13, one belt driven pipe cutting and threading machine, \$720; class 17, one bolt cutter, \$315; class 19, one standard open side planer, \$6927.

Harron, Rickard & McCone, San Francisco, Cal., class 14, one combination belt driven radial drill, \$819; class 18, one wet tool grinder, \$237.90.

Under bids opened December 4 for supplies for the navy yards the following awards have been made:

The General Electric Company, Schenectady, N. Y., class 71, one induction motor, \$536; class 72, one motor generator set, \$2630.

The Western Electric Company, New York, class 73, one motor, \$187.

The Fox Machine Company, Grand Rapids, Mich., class 74, one emery grinder, \$58.90.

The Detrick & Harvey Machine Company, Baltimore, Md., class 162, one band saw setting and filing machine, \$105.

Under bids opened November 1, Circular No. 335, for supplies for the Isthmian Canal Commission, the H. A. Rogers Company, New York, has been awarded class 4, 18 hydraulic punches, \$1113.38.

The following awards have been made for supplies for the navy yards, bids for which were opened November 13:

The G. & W. Mfg. Company, New York, class 11, one 15-ton hand traveling crane, \$688.

The Morgan Engineering Company, Alliance, Ohio, class 23, one 60-ton crane, \$10,195.

Harron, Rickard & McCone, San Francisco, Cal., class 55, one heavy upright tubular boiler, \$482.

The B. F. Sturtevant Company, Hyde Park, Mass., class 102, three 100-kw. generating sets with spare parts, \$16,907.65; class 103, four 50-kw. generating sets with spare parts, \$16,301.95.

The following awards have been made for supplies for the navy yards, bids for which were opened November 27:

The Phoenix Iron Company, Meadville, Pa., class 21, one 100-hp boiler, \$795.

The Jones & Lamson Machine Company, Springfield, Vt., class 31, two turret lathes, \$2854.

The Brown & Sharpe Mfg. Company, Providence, R. I., class 32, two universal grinding machines, \$1333.66.

The Walter H. Foster Company, New York, class 33, one universal grinding machine, \$1491.

The Prentiss Tool & Supply Company, New York, class 51, one 12-spindle motor driven drill, \$2375.

Manning, Maxwell & Moore, class 52, one motor driven pipe cutting machine, \$1245.

Under bids opened October 30 for supplies for the navy yards the following awards have been made:

The Alliance Machine Co., Alliance, Ohio, class 11, one overhead electric traveling crane, \$5935.

The Chicago Pneumatic Tool Company, New York, class 97, two automatic motor hoists, \$440.

The following awards have been made for supplies for the navy yards under bids opened October 9:

The H. A. Rogers Company, New York, class 108, three motor driven lathes, \$2655.50.

Manning, Maxwell & Moore, New York, class 109, one duplex milling machine, \$910; class 113, one improved patent edge molder and shaper, \$485.

The H. B. Smith Machinery Company, Smithville, N. J., class 112, one patent parallel swing saw, \$375.

### The Mineral Production of the United States in 1905.

A most interesting chapter in the volume entitled "Mineral Resources of the United States, 1905," published by the United States Geological Survey, is that which contains a summary of the mineral production of the United States during that year.

In 1905, for the seventh time, the total value of our mineral production exceeded \$1,000,000,000. The exact figures for 1905 are \$1,623,877,127, as compared with \$1,360,883,554 in 1904.

As heretofore, iron and coal are the most important of our mineral products. The value of the pig iron produced in 1905 was \$382,450,000; the value of the coal, \$476,756,963. The fuels increased from \$584,043,236 in 1904 to \$602,477,217 in 1905, a gain of \$18,433,981, or 3.16 per cent. Anthracite coal showed an increase in value of \$2,904,980, from \$138,974,020 in 1904 to \$141,879,000 in 1905. The increase in value of the bituminous coal output over 1904 was \$29,480,962, a combined increase in value of coal of \$32,385,942 in 1905, or 7.3 per cent.

The gain of \$262,903,573 in the total value of our mineral production is due to gains in both metallic and nonmetallic products, the metallic products showing an increase from \$501,099,950 in 1904 to \$702,453,108 in 1905, a gain of \$201,353,158, and the nonmetallic products showing an increase from \$859,383,604 in 1904 to \$921,024,019 in 1905, a gain of \$61,640,415. To these products should be added estimated unspecified products, including molybdenum, bismuth, tungsten and other mineral products, valued at \$400,000, making the total mineral production for 1905 of \$1,623,877,127.

Besides the usual table and summary of quantities and values of the country's mineral output by products, the volume contains this year, for the first time, a summary, in tabulated form, of the value of the mineral products by States. These tables were compiled by Wm. Taylor Thom.

The Federal Furnace Company, Chicago, to provide additional working capital, has increased its stock issue from \$600,000 to \$800,000. This company is now building a blast furnace at South Deering, which will probably be blown in after the first of the year. The erection of another stack will be commenced in the spring, the power equipment being of sufficient capacity to operate a two-furnace plant.

The Merchants' and Manufacturers' Association has been organized and incorporated at Bluffton, Ind., for the purpose of buying, holding and selling land for the location of factories, &c.



## Trade Publications.

**Transformers.**—Wagner Electric Mfg. Company, St. Louis, Mo. Folder. Deals with the types M and MH transformers. An interior view of these is given and also exterior views of the various sizes of transformers. They are built of any capacity and for any voltage.

**Calendar.**—Climax Mfg. Company, Corry, Pa., builder of geared locomotives. Wall calendar for remainder of 1906 and the whole of 1907. Sheets for each month, each bearing an illustration of a locomotive engaged in some special class of work.

**Water Softening.**—Wm. B. Scaife & Sons Company, Pittsburgh, Pa. Folder. The cover pages are reproductions of a scaled boiler tube and of one which is clean. The scaled tube bears the query: "Is this economy?" and the clean tube bears the statement, "This is economy." The inside of the folder contains statements from some of the users of We-Fu-Go and Scaife water softening and purifying systems, regarding the savings effected in fuel and in the operation of boilers. The folder also contains illustrations of several installations.

**Air Compressors.**—Ingersoll-Rand Company, 11 Broadway, New York. Catalogue X 36. Pertains to the Imperial type 10, steam and power driven air compressors. Illustrations of the various classes and types and details in a tabular form of the duplex steam, duplex air; duplex steam, compound air; compound steam, compound air, and compound steam, duplex air compressors are given. These are designed for steam pressures of 80 to 120 lb. and terminal air pressures of 20 to 100 lb. Air receivers and pressure tanks for 100 to 150 lb. working pressure, and tested to 225 lb. water pressure are also included.

**Machinery.**—L. F. Seyfert's Sons, 437 North Third street, Philadelphia, Pa. Catalogue No. 101. This is entitled "Things You Need in Making Other Things," and lists the company's line of hoisting and electrical machinery, wood and iron working machinery, engines, boilers, pumps, &c.

**Combination Electric Meter.**—H. W. Johns-Manville Company, 100 William street, New York. Circular. Deals with the Victor combination meter, which is a direct reading instrument for direct current, giving volts, amperes, watts and horsepower simultaneously. The dials of these meters are illuminated from the rear. The meters are made in three sizes and for all commercial ranges of current and pressure.

**Milling Machines.**—Owen Machine Tool Company, Springfield, Ohio. Page for insertion in loose leaf catalogue. This pertains to the No. 2-A universal miller, designed to meet the modern requirements of high speed milling. Dimensions and specifications of this miller are given.

**Pavement Lights, Skylights, &c.**—American Bar-Lock Company, Twenty-sixth street and Pennsylvania avenue, Philadelphia, Pa. Catalogue. Devoted to Bar-Lock galvanized wrought steel construction with 3-point prisms and Arch plain lights for pavements, floors and skylights. Illustrations of installations and a partial list of buildings where they have been made are included. Two reproduced photographs show a test of Bar-Lock construction 4 ft. wide over a 7-ft. span sustaining a weight of 10,766 lb. of pig iron.

**Electrical Apparatus.**—General Electric Company, Schenectady, N. Y. Bulletins, flyers, &c. Flyer No. 2191 deals with reversing motor starting rheostats of the RS type with self-contained resistance and with cover and type C form G circuit breakers. Supply catalogue No. 7600 lists the various types of controller contact fingers and handles. Bulletin No. 4451 pertains to the 44-watt, 22 c. p. Tantalum incandescent lamp. A list of prices of Tantalum lamps and Holophane Pagoda reflectors for these lamps is given. Bulletin No. 4452 illustrates and lists the parts of direct current series inclosed arc lamps of the forms 10 and 11. No. 4463, superseding No. 4434, deals with Edison Gem high efficiency incandescent and meridian units. Photographs show an installation of these lamps in a church and a bank. No. 4454 describes and illustrates the construction of the GE-90 railroad motor, and No. 4455 concerns the type 18 form KG single-phase motors. Price-list No. 5153, superseding all previous issues, lists Edison gem-filament street series incandescent lamps. Indexes to bulletins, descriptive and supply catalogues, pamphlets, flyers and price-lists are now being distributed by the company.

**Pneumatic Hammers.**—Dayton Pneumatic Tool Company, Dayton, Ohio. Circular. Deals with the Nos. 1, 1x, 2, 3, 4, 40, 60, 80 and 90 Green automatic hammers, for which special advantages are claimed.

**Arc Lamps.**—Stanley-G. I. Electric Mfg. Company, Pittsfield, Mass. Bulletin No. 618, superseding No. 37. Pertains to the 100 to 125 volts multiple direct current arc lamps of the L 4 and L 14 types. These lamps measure only 15½ in. over all in height and are particularly desirable for use with low ceilings. An index to catalogue numbers is appended.

**Metallic Packing.**—C. Lee Cook Mfg. Company, Louisville, Ky. Catalogue. Devoted to Cook's metallic packing for steam, gas and air power engines of every description. Description of the various types of packings and a list of users is included.

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# HARDWARE

**P**OSTAL matters are beginning to come to the front and in more than one direction there is indication of renewed activity in the proposal of changes which are advocated in one quarter or another. Announcement has been made in the Canadian Parliament that the Postmaster-General is preparing a bill providing for an extension of the parcels post system which shall include a provision for the collection of moneys on delivery of goods. In this country, too, postal matters are coming formally before Congress at the suggestion of the Post Office Department, in regard to which the letter of our Washington correspondent on another page will be of interest. By far the most important recommendations for legislation emanating from this Department in connection with the usual annual reports are those to be presented by the Third Assistant Postmaster-General. They are of vital interest to manufacturers and merchants, wholesale and retail, quite apart from the campaign in the interest of the mail order houses, for while they propose an important reduction in the postage of merchandise, they also suggest the adoption of penny postage as applied to local letters. Some excellent suggestions are made, with a variety of alternative recommendations of legislation, some of which will generally be regarded by the commercial classes with more or less decided disfavor. There is thus presented a curious combination of wise and unwise projects that will cause merchants no little anxiety until the annual Post Office Appropriation bill is finally disposed of.

In another column we describe methods in use by a prominent Eastern Hardware house looking to the education of its employees and the cultivation of an intelligent and sincere *esprit du corps*. The essential feature of the plan is the spending of an evening together, when the principals and their subordinates meet socially at an informal dinner, with a view not only to discussing business conditions but also to give special attention to the bringing out of information in regard to the manufacture and quality of some leading line handled by the house, and the suggestion of the best methods to be pursued in selling it. It is thus intended to give to all the benefit of the counsels and experience of those who are recognized as to a greater or less degree specialists, and to elicit suggestions from any who may be able to contribute something for the general good. It is easy to see that the salesmanship of employees may thus be materially improved, especially by a more extended and intimate knowledge of the goods which they have to handle. Talking points are better understood and the wants of the customer are better administered to, for he is given assistance which he may appreciate very highly. This quite likely means the difference between effecting or losing a sale.

We also give an account of a recent gathering of those connected with a Western house with a view to consulting together in regard to improving salesmanship and store service. The monthly meetings which are held are referred to as not only very enjoyable but as exceedingly profitable and suggestive and resulting in a more intelligent and loyal co-operation in carrying on the business of the house.

## Condition of Trade.

While the greater part of the important lines in the Hardware field have already advanced the market continues to have an upward tendency and the announcement of higher prices in goods which have up to this time been held at former figures are being made from day to day. At the same time in some staple lines, especially those lying near the raw materials, further advances are taking place. Contributing to this condition there is not only the high price of Iron and Metals, but practically of all materials entering into articles handled by Hardware merchants. The effect of the extraordinary rise in Copper is not yet at all adequately reflected in articles in the making of which this Metal is used. The growing scarcity of timber is also an increasing factor in imparting strength to goods into the construction of which wood enters. The greater cost of living also is reflected in many payrolls. In connection with all these influences giving strength to the market there is the fundamental fact that the manufacturers find their facilities overtaxed by the volume and persistency of the demand which comes to them from the trade. The holiday season fortunately brings some interruption with the usual course of things and a perceptible lessening in the placing of orders. The impression prevails among the trade that this slackening of the pace is but temporary, and the anticipations of a great volume of business next year are general. The present year certainly draws to a close with a record which in many respects surpasses that of any of its predecessors. Merchants and manufacturers generally are giving attention to ascertaining the results of the year's work and to maturing plans for the activities of the new year. For our readers generally we trust that the balance sheet of 1906 will show ample reward for their enterprise and efforts, and that the new year will be characterized by a continuance of prosperity and well being.

### Chicago.

Although the abnormal activity which characterized the first three weeks of the present month is expected to subside during the holiday week, nevertheless the large distributors in this district anticipate a record volume of business for December, greatly exceeding the closing months of previous years and comparing favorably with September, October and November. The requirements of the building trades have, to a large extent, been curtailed, and makers of Builders' Hardware are beginning to make inroads on their accumulated specifications. In the heavy lines the inability of the mills to make early deliveries has diverted a large tonnage to the distributors, and premiums are readily secured on orders of assorted sizes. Heavy sales of wagon wood stock are also reported, frequent advances and the shortage of material having made manufacturers anxious regarding their future supply. The Wire Cloth manufacturers, without exception, have already done a tremendous business for next season's requirements, and the indications favor an early advance on all grades as well as Poultry Netting. Sheet Copper and Bottoms have been advanced 2 cents a pound, the upward movement of prices being in sympathy with the advancing copper market. The holiday trade of the retail merchants has been unusually heavy, and only small stocks will be carried over. Collections are fully up to the normal for this season, the West not being affected to any great extent by the tight money situation in the East.



## NOTES ON PRICES.

**Wire Nails.**—Orders taken by manufacturers during December have already exceeded the tonnage for the whole of the corresponding month of last year. Stocks in the hands of the trade are reported as only normal. Shipments and deliveries are materially interfered with by the shortage of cars. The demand in the way of new business is good, and specifications on contract orders are being received freely by the mills. Prices are firm, and some of the mills who purchase Rods are reported to be asking slight premiums for prompt deliveries. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....\$2.00  
Carload lots, to retail merchants..... 2.05

**New York.**—As usual at this season demand is somewhat moderate and will probably continue so until inventory taking is out of the way. Prices are being very well maintained. New York quotations are on the following basis: To retailers, carloads, on dock, \$2.19; less than carloads, on dock, \$2.33; small lots, at store, \$2.30.

**Chicago.**—The tonnage of Nails booked by the leading interests during the present month is already larger than the total taken on last December, and the indications are that the month will rank favorably with October and November. A careful canvass of the trade shows only normal stocks, and there has been practically no speculative buying. Many of the large distributors are now preparing for the spring trade and in anticipating requirements the pressure on the mills during the spring months will be greatly relieved. Quotations are unchanged, as follows: \$2.15 in car lots to jobbers, and \$2.20 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

**Pittsburgh.**—The last week of the year finds the Wire Nail trade in excellent condition as regards contracts on the books of the mills, the chief trouble at present being shortage of cars, which is interfering very materially with shipments. Should some bad weather set in with heavy snows the situation would get worse, and it is bad enough at present. Mills report continued good demand for Wire Nails, while specifications on contracts are coming in very freely. This has undoubtedly been the best year as regards tonnage the Wire Nail trade has ever had. Prices continue very firm, and we are advised that some of the smaller independent mills that buy Rods in the open market are asking slight premiums on Wire Nails for prompt delivery. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....\$2.00  
Carload lots, to retail merchants..... 2.05

**Cut Nails.**—Jobbers' stocks are reported as being low and mills are behind in deliveries. The inability of mills to get Steel delivered together with car shortage is interfering with the making and the shipment of Nails. Some of the Eastern mills are reported to have sold their product for the next three months and are out of the market for that length of time, so there would appear to be little immediate relief in sight. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

**New York.**—There is comparatively little doing in the local market, owing to the lateness of the season. New York quotations are generally maintained on the basis of \$2.30 for small lots at store.

**Chicago.**—Shipments from Eastern mills are exceedingly light and local stocks are badly broken and of small proportions. At no time in the history of the Cut Nail trade of the West have conditions been comparable with those prevailing at present, and no immediate relief is in sight. Prices are firmly maintained as follows: Iron Cut Nails, car lots, to jobbers, \$2.30; to retailers, \$2.35; Steel, to jobbers, in car lots, \$2.20; to retailers, \$2.25.

**Pittsburgh.**—The mills are still behind in orders and the car shortage, together with difficulty in getting deliveries of Steel, is interfering very materially with output and shipments. Stocks held by jobbers are reported as very low and some of the larger Eastern Cut Nail mills are reported as having their product sold for the next three months and are out of the market for that period. Specifications on contracts are coming in very freely and shipments by the mills are heavy. Prices are firm, f.o.b. Pittsburgh, as follows: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

**Barb Wire.**—Jobbers are preparing for a heavy spring business if the large orders being placed by them are an indication of anticipated demand. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots .....	\$2.15	\$2.45
Retailers, carload lots .....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

**Chicago.**—The heavy buying which has prevailed throughout the month indicates that jobbers are preparing for a heavy spring trade and are anticipating their requirements. Stocks generally are low, while mill warehouses are practically depleted. We quote: To jobbers, Chicago, car lots, Painted, \$2.30; Galvanized, \$2.60; to retailers, car lots, Painted, \$2.35; Galvanized, \$2.65; retailers, less than car lots, Painted, \$2.45; Galvanized, \$2.75; Staples, bright, in car lots, \$2.25; Galvanized, \$2.55; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

**Pittsburgh.**—Some heavy orders are being placed by jobbers for their spring trade, which would indicate that they are endeavoring to accumulate as large stocks as possible, fearing the mills may not be able to make prompt deliveries later on. Demand from jobbers is light and will continue so until early in the new year. The market is firm, and we are advised official prices are being held. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots .....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

**Smooth Fence Wire.**—Specifications on contract orders are in excess of the output of the mills. New orders are light, as buyers have generally anticipated their requirements. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads .....

Retailers, carloads .....

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55	
Galvanized.....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15

**Chicago.**—New business continues comparatively light, which is customary at this season, although specifications show no decline in volume. We quote \$2, f.o.b. Chicago, in car lots to jobbers; retailers, \$2.05.

**Pittsburgh.**—The Wire Fence manufacturers and other large consumers are specifying freely on contracts, but new demand is lighter for the reason that the large trade has covered. Specifications on these contracts are larger in volume than output. Prices are firm and are being rigidly held. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads .....

Retailers, carloads .....

The foregoing prices are for base numbers, 6 to 9.

**Hand Bells.**—An advance of approximately 10 per cent. has just been made by several manufacturers of Hand Bells. It would appear that this change is to cover the increased cost of raw material which has moved up several times without any reflection in the price of

these goods. One important producing company writes that it has deferred making any advance thinking there might be a reaction in the Metal market, but the latter has recently developed an upward rather than a downward tendency, so that an immediate advance in their product was imperative. Polished Brass Hand Bells may now be quoted to the retail trade at 60 per cent. discount; White Metal Bells at 50 and 10 per cent. and Nickel Plated at 50 to 50 and 10 per cent.

**Henry Disston & Sons.**—The following new discount sheet will be issued by Henry Disston & Sons, Philadelphia, on January 1. It applies to the company's catalogue dated July, 1906. It will be observed that while some slight advances are announced no radical changes have been made in the discounts, the company being exceedingly conservative in this regard, merely making advances which are necessary in view of the increased cost of the raw material. The discount sheet is as follows:

Inserted Tooth Saws, Points and Holders.....	
Rift Saws.....	
Inserted Tooth Saws and Teeth (American Saw Company's patterns).....	
Machine for sharpening Inserted Teeth.....	
Solid Tooth Circular Saws.....	
Circular Saw Repairs.....	
Shingle and Heading Saws.....	
Segment Veneer Saws and Repairs.....	50 %
Circular Miter Saws.....	
Concave Saws.....	
Grooving Saws.....	
Cork, Paper and Cloth Knives.....	
Circular Milling Saws for Newton and other Milling Machines.....	
Circular Saws and Disks for Hot or Cold Metal.....	
Circular Slate Saws.....	
Screw Slotting Cutters.....	50 %
Metal Slitting Saws.....	
Circular Milling Saws for "Bryant" and "Higley" machines.....	50 %
Circular Milling Saws, Inserted Tooth.....	50 %
Mill and Mulay Saws.....	
Gang and Deal Saws.....	
Drag Saws.....	50 %
Pit, Whip and Futtock Saws.....	
Tiller Handles.....	
Pond and Hand Ice Saws.....	

#### Cross-Cut Saws.

Diamond Point Vlm and Vlm Champion.....	
Oriole, Novo, Diamond Tooth.....	
Great American Nos. 1 and 2, Lumberman.....	
Lancet, Perforated Lance, Electric.....	
Fleam, Tenon, Plain.....	
Champion Nos. 1 and 2, Tuttle, Miner's.....	45 %
Caribou, Beaver, Felling No. 1.....	
Sterling, International, International Felling.....	
Humboldt, California, Toledo Blade, Sabine.....	
Nevada, Nevada Felling, Lancet.....	
Pacific, Oregon Perforated, Oregon not Perforated.....	
Triumph or Narrow Champion, Great American and Toledo.....	50 %
One-man Perforated Lance, Nos. 1 and 2.....	
One-man Great American.....	
One-man Champion, Nos. 1 and 2.....	45 %
One-man Keystone Champion, No. 3.....	
One-man Lumberman.....	
One-man Miner's.....	
Cross-Cut Saw Handles.....	50 %
Cleaner Tooth Gauges.....	50 %
Universal Cross-Cut Saw Tool.....	30 %
Saw Mandrels.....	25 %
Speed Indicator.....	
Saw Gummers and Cutters.....	
Band Saw Swage.....	30 %
Gumming Press and Hand Shear.....	
Swages.....	
Hammers, Anvils, Swage Bars, Setting Stake.....	Net.
Straight Edges, Brazing Clamps, Slide Files.....	
Saw Sets.....	
Saw Clamps and Filing Guide.....	30 %
Hand Saw Jointer.....	
Wire Gauges and Nail Gauges.....	
Band Saws, 2 in. to 18 in. wide.....	60 %
Band Saws, 1/4 in. to 1 1/4 in. wide.....	60 %
German Web Saws.....	
Turning and Pay Webs.....	
Felloe and Canadian Webs.....	25 %
Gln Roller and Doctor Blades.....	
Hand Saws, Nos. 112, 12, 99, 9, 16, D-100, D-8, 120, 76, 77 and 8.....	25 %
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1, 0, 00.....	30 %
Combination Saws.....	
Gauge Saws, Movable Back Saws and Ship Carpenters' Saws.....	
Hand Hack Saws and Plumbers' Saws.....	
Compass, Nest, Keyhole and Coping.....	
Pattern Makers', Dovetail, Turkish, Stairbuilders' and Joiners' Saws.....	25 %
Saw Handles.....	
Pruning Saws.....	
Currier Blades and Cabinet Scrapers.....	
Back Saws.....	
Wood Saw Blades.....	
Wood Saw Rods, Plain.....	20 %
Wood Saw Rods, Tinned.....	15 %
Framed Wood Saws, Wood Saw Frames and Saw Bucks.....	25 %
Butcher Saws, Dehorning Saws and Saw Knives.....	
Kitchen Saws.....	30 %
Butcher Saw Blades.....	
Hack Saw Frames.....	30 %
Disston's Concave Ground Hack Saw Blades.....	25 %
Keystone, Chromol, Flexible Back and Machine Hack Saw Blades.....	35 %
Plastering, Corner, Circle, Edging Trowels.....	20 %
Brick, Pointing, Gauging Trowels.....	25 %

Garden Trowels.....	
Standard Brand Trowels.....	
Quaker City Brand Trowels.....	30 %
Coke Trowels.....	
Cane, Corn and Hedge Knives.....	
Post Hole Diggers.....	
Pruning Hook and Saw.....	25 %
Machinists' Rules, Squares, Bevels, Levels, Gauges and Straight Edges.....	
No. 3 Bevel, Nos. 5 1/2 and 11 Squares.....	15 %
Try Squares and Bevels.....	
Mortise Gauges.....	60 %
Shafting and Pocket Levels.....	10 %
Plumbs and Levels.....	
Trammel Points and Plumb Bobs.....	
Screw Drivers, Handles and Ferrules.....	70 %
Slaw Cutters, Vegetable Cutters, Corn Graters, Potato Shredders.....	30 %
Crout Cutters.....	35 %
Files and Rasps, List of November 1, 1899.....	75 %
Superfine Files.....	50 %
Special Hand, Compass, Keyhole and Kitchen Saws (see special sheet July 2, 1906).....	

**Stove Hollow Ware.**—The market for Stove Hollow Ware, which sustained a moderate advance a few weeks ago, as announced in these columns, has again moved upward under the influence of higher prices for raw material. The change amounts to about 5 per cent. on the general line. Following are the discounts, which may be taken as representative of prices to the general retail trade, but it is probable that lower prices may be obtained from jobbers who have stocks purchased at a lower level:

Stove Hollow Ware:	
Plain or Unground.....	60 %
Ground ware.....	50 and 5 %
Enameled Ware.....	45 and 10 %
Country Hollow Ware, per 100 lb.....	\$2.75
White Enameled Ware:	
Maslin Kettles.....	65 and 10 %
Covered Ware:	
Tinned and Turned.....	35 and 10 %
Enameled.....	45 and 10 %
Glue Pots:	
Tinned.....	30 and 10 %
Enameled.....	35 and 10 %
Kettles, sugar, and Pots, English.....	12 1/2 % advance.

**Copper Products.**—The market for Copper materials is still sharply advancing and appears to be purely a matter of supply and demand, with predictions in the trade of further increases to follow. Some of the commodities in Copper and Brass are quoted as follows: Sheet Copper, 29 cents per pound, base; Copper Rod, 29 cents per pound, base; Copper Bottoms, Pits and Flats, 33 cents per pound, base; Soldering Copper, 28 cents per pound, in lots of 300 lb. and over; Copper Wire, 30 cents per pound, base; Seamless Copper Tubes, 31 cents per pound, base; Copper Rivets and Burrs, 33 1-3 per cent. discount; Seamless Brass Tubes, 26 cents per pound, base; Brazed Brass Tubing, 16 per cent. discount; Brass Rods, 6 per cent. discount, and Brass Wire and Sheet Brass, net list.

**Saws.**—The leading manufacturers of Saws will make advances in their prices, to take effect the first of the year. By some the change has already been announced, and it would seem that their action had been decidedly moderate in view of the heavy demand for Saws and the great difficulty in filling orders, with which the trade is entirely familiar. In comparison with the Tool market generally the price of Saws may be said to have held conspicuously low for many months.

**Sad Irons.**—Manufacturers of Sad Irons have made concerted announcement of an advance of 7 cents per set on Mrs. Potts' Irons, to take effect at once. The new prices continue subject to the usual concessions on car-loads and 20-case lots.

**Asphalt Ready Roofing Company.**—On account of the increased cost of Dry Felt and other materials used in the manufacture of its Roofing the Asphalt Ready Roofing Company, 136 Water street, New York, has found it necessary to make a moderate advance in the price of its Arrow brand and Protection brand Roofing.

**Rope.**—The market is firm on Manila and Sisal Cordage, while manufacturers of Jute Cordage find it difficult to fill the demand. From the present condition of the market manufacturers see no probability of an immediate decline. New York quotations are as follows: Pure Manila, 12 1/2 to 13 cents; B quality, 11 1/2 to 12 cents; Pure Sisal, 9 1/4 cents; No. 2 quality, 8 cents; No. 1 Jute, 1/4 in. and up, 8 1/4 to 8 1/2 cents; No. 2 Jute, 7 1/4 to 8 cents per pound.



**Sash Weights.**—The Sash Weight market is gradually developing higher prices, owing to the increased cost of the raw material. There does not appear to be any special concert of action among the manufacturers, and revised prices are from time to time announced according to the special circumstances in each market. The prices for the East are represented in a general way by \$30 per ton, the prices for the West ranging from \$22 to \$28.

**Table Cutlery.**—The market for Table Cutlery under the pressure of the heavy demand and the increased cost of the goods is decidedly strong, and it is regarded as not unlikely that higher prices will be announced in the near future.

**Lumbering Tools.**—The increased cost of timber affects directly the production of Lumbering Tools, as does also the condition of the Iron market. As a result manufacturers have been revising their quotations and making slight advances.

**Rolled Thread Bolts.**—There has been a stiffening in the price of Rolled Thread Carriage Bolts on the part of the associated manufacturers whose published discount to the retail trade has become 75 per cent. The market, however, remains in effect an open one, as there are several outside manufacturers whose product is a considerable factor. Rolled Thread Bolts are increasingly used for many purposes, and are being handled by jobbers to a large extent.

**Sinks.**—Prices on Sinks have been withdrawn by all the leading manufacturers, and advances of 5 to 10 per cent. have been announced to take effect January 1. The change includes Enameled Sinks and Bath Tubs, as well as Painted and Galvanized lines.

**Wrought Goods.**—An advance of 10 per cent. has just been made by leading manufacturers of Wrought Goods. The price of this line has remained unchanged for many months and has been somewhat below the level of related lines. The present movement therefore does not come as a surprise to the trade. On the basis of the advance the market to retail trade may be represented in a general way by a discount of  $87\frac{1}{2}$  to  $87\frac{1}{2}$  and 10 per cent.

**Linseed Oil.**—The final estimated report on the production of Flaxseed places the yield as 25,876,146 bushels, gathered from 2,505,927 acres. This is far short of the estimate of the crop about a month since, which was 27,200,000 bushels, and the fact that the actual yield is below that of 1905 is regarded as a factor that will sustain the market for Oil on a firm basis, particularly as very little seed is understood to have been carried over from the last crop, while the surplus from the previous year was very large. The market has thus a firmer tone, but quotations continue unchanged and demand is light at present. New York quotations are as follows, according to quantity: City Raw, 42 to 43 cents per gallon; Out of Town Raw, 41 to 42 cents per gallon. Boiled Oil is 1 cent per gallon over Raw.

**Spirits Turpentine.**—The local market is without special features, owing to holiday week. The Savannah market is well sold up and prices are firm. New York quotations are as follows, according to quantity: Oil Barrels,  $69\frac{1}{2}$  to 70 cents; Machine Made Barrels, 70 to  $70\frac{1}{2}$  cents per gallon.

**Window Glass.**—It is understood that the order placed by the Eastern and Western Jobbers' associations with the National Brokerage Company, aggregating 600,000 boxes, was completed on the 20th inst. The National Company and the American Window Glass Company thereupon withdrew all previous quotations, and a new schedule of prices went into effect on the 21st inst., involving a 5 per cent. advance. Local jobbers will probably advance prices at least 5 per cent. during the week. Jobbers' quotations, from jobbers' list October 1, 1903, are as follows: Greater New York, 90 and 10 per cent. discount for all sizes, single and double strength; outside of Greater New York, 90 and 5 for single and 90 and 10 per cent. discount for double strength Glass.

## SUIT BY MONTGOMERY WARD & CO., AGAINST SOUTH DAKOTA ASSOCIATION.

**I**NJUNCTION proceedings have been commenced by Montgomery Ward & Co., a Chicago mail order house, in the United States Circuit Court at Sioux Falls against the South Dakota Retail Merchants' Association to restrain its officers, Board of Directors and members from making alleged verbal and written threats published and mailed, to the effect that unless certain manufacturers, wholesalers and jobbers ceased selling merchandise to Montgomery Ward & Co., they would be listed and published as sellers to and dealers with catalogue houses, and as such discriminated against and boycotted by members of the association.

It is further alleged by Montgomery Ward & Co. that they are unable to purchase merchandise from certain manufacturers as a result of this campaign, which they state was initiated at the last annual convention held at Mitchell, S. D., January 23-26, 1906. The following letter is made a part of the bill, which it is alleged was mailed to wholesalers and jobbers under instructions from the Board of Directors of the South Dakota Association:

The South Dakota Retail Merchants in convention assembled January 23, 24, 25, 26, 1906, expressed strong sentiments and were unanimous on the subject relative to selling of merchandise by jobbers and manufacturers to the catalogue or mail order houses; that it was unfair treatment on the part of the wholesalers toward the retailers. The retail merchants of South Dakota feel that the cause of the catalogue house has been advanced by the wholesaler inasmuch as the stock of the mail order house is carried by the wholesaler. The retail merchants have suffered in consequence of this arrangement.

Will you not act with the retail merchants? Do you at the present time encourage and help the catalogue business? Will you not refuse to sell to the mail order houses, and will you confine your trade to the legitimate retail dealer?

Any suggestions for co-operating for mutual interests of both the wholesaler and retailer we would as a body of merchants be glad to receive and consider.

This letter is indorsed by the Board of Directors as above named and sent out under its directions.

Yours truly,

(Signed) L. S. TYLER, Secretary.

The bill also sets forth that a copy of the list of those who failed to agree to sever relations with Montgomery Ward & Co. and other catalogue houses, and which it is alleged was distributed among the members of the association, is in the plaintiff's possession and will be offered in evidence. Nominal damages to comply with legal requirements are claimed. January 3 has been fixed upon as the time when the case will come up on motion that a temporary injunction be granted. The result of this litigation will be awaited with interest, as it is understood that Montgomery Ward & Co., contemplate taking action against other associations if they are successful in this case.

## McVOY, WESSLING HARDWARE COMPANY SUCCEEDING WELLS & NELLEGAR COMPANY.

**O**N or before January 31 the Wells & Nellegar Company, 72-76 Lake street, Chicago, for nearly 30 years in the Hardware jobbing business, will be succeeded by the McVoy, Wessling Hardware Company. The new company has not yet perfected its incorporation under Illinois laws, but it is hoped to receive the charter in a few days, when officers will be elected. Among the parties who will be actively interested in the new company will be Joseph I. McVoy, who has for many years been identified with the Tin Plate and Sheet Metal trade of Chicago, and Milton P. Wessling, who has for a long period been associated with the Wells & Nellegar Company as buyer. The stockholders will also include the following persons now identified with that company: Gilbert Samuelson, Louis E. Simons, William R. Nellegar, G. Howard Canniff, Joseph B. Bettles, Walter J. Spreng, Henry M. Sayles, Theo. Heintz, and William R. Jenkins. The direction of the affairs of the new house will thus be under the care of practical Hardware men, who will have the best wishes of the trade for their success and prosperity.

## MARINE HARDWARE & EQUIPMENT COMPANY.

**A**N exceptionally well arranged catalogue and price-list for 1906-7 has been issued by the Marine Hardware & Equipment Company, South Portland, Maine. The company manufactures an extensive line of Marine Hardware and Galvanized Ship, Yacht and Boat Trimmings, and does all kinds of general iron work in Drop Forging, Gray and Malleable Iron Castings, Galvanizing, Tinning, Japanning, &c. The catalogue is of the loose leaf variety, and for the greater convenience of the trade is printed on one side of the pages only, so that additions and changes can be made at a minimum expense. Each page, moreover, lists one article only, which is illustrated with a fine half tone cut, so that cut and list are surrounded by plenty of white space. The publication is a model of clear, convenient and effective cataloging and will doubtless be thoroughly appreciated by the trade.

## REQUESTS FOR CATALOGUES, &c.

*The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

**REQUESTS** for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM GEO. E. DENLEN COMPANY, Cumberland, Md., wholesale and retail Hardware, Paints, Roofing and Railroad, Contractors' and Builders' Supplies.

FROM H. K. & C. J. POWLES, Hagerstown, Md., who have succeeded to the Hardware, Paint, Harness and Implement business formerly conducted by Samuel Emmert. The members of the new firm were formerly in Mr. Emmert's employ.

FROM H. P. HURLBURT & Co., who recently embarked in the Shelf Hardware business at Hudson, Mass.

FROM MONTICELLO HARDWARE COMPANY, Monticello, Ga., which is just entering the wholesale and retail business at that point.

FROM WEAVER HARDWARE COMPANY, Rochester, N. Y., which has lately been organized. The company plans to occupy the stores at 31, 33 and 35 Main street East on or about April 1 next, where it will conduct a wholesale and retail business in Builders' and General Hardware, Agricultural Tools and Implements and House Furnishing Goods. The name of Weaver has been identified with the Hardware business at this location for a period of 40 years. After January 1 the temporary warehouse and office which the company expects to use until possession is taken of the stores as above will be at 1 Aqueduct street.

FROM LAWRENCE HARDWARE COMPANY, Butler, N. J., whose store was burned out on December 17. The company is again ready for business, however, having purchased the stock and fixtures of R. H. Matthews. It expects to occupy a new building about January 1 and catalogues are requested of Plumbing and Heating Goods as well as Hardware.

FROM SAN ANTONIO HARDWARE COMPANY, San Antonio, Texas, which conducts a wholesale business in Hardware and allied lines.

FROM W. I. WITHERSPOON, Yorkville, S. C., who is about to commence the sale of Hardware, Agricultural Implements and Vehicles. Mr. Witherspoon, in the way of Vehicles, is specially desirous of getting into communication with manufacturers of Buggies and Wagons that are not at present finding a sale in his market.

## TRADE ITEMS.

THE eighth half-yearly distribution of a bonus to the most efficient employees of over 10 years' standing took place on Saturday, December 22, in the factory hall of the Remington Typewriter Works of Wyckoff, Seamans & Benedict, Ilion, N. Y. The number of employees participating—269—was the largest since the scheme was instituted, and \$13,450 in gold was divided, giving \$50 for the half year to each person. A similar distribution takes place each June. The following periods of continuous employment were represented, out of a total of 1700 employees: Three men over 33 years; 6 men over 25 years; 39 men over 20 years; 90 men over 15 years, and 131 men over 10 years. The prizes and certificates for good suggestions adopted during the half year were presented at the same time.

THE KENTUCKY RETAIL HARDWARE AND STOVE DEALERS' ASSOCIATION will hold its seventh annual convention at the Galt House, Louisville, on February 5, 6 and 7. The meeting promises to be a large and interesting one. Firms desirous of making an exhibit in connection with the meeting are requested to communicate direct with the manager of the Galt House. Those who desire to advertise in the programme, which will be issued by the association, are invited to correspond as early as possible with the secretary, John R. Sower, Frankfort.

A. W. WALTER, sales and advertising manager of the Walter Hardware Company, South Milwaukee, Wis., will sever his connection with that firm January 1, at which time he will become a traveling representative of the Atlantic Stamping Company, Rochester, N. Y. Mr. Walter will call on the trade in Wisconsin and Minnesota in the interest of the Atlantic Company.

THE property and interests of the Robin Hood Powder Company, Swanton, Vt., have been taken over by a new corporation known as the Robin Hood Ammunition Company. The directors of the new company are Sir William C. Van Horne, Montreal; former Governor Edward C. Smith, W. Beecher Fonda, Charles E. Schoff and T. Harry Richardson, St. Albans, Vt. Edward C. Smith is president, E. H. Richardson, vice-president and secretary, and Charles E. Schoff, manager and treasurer.

THE COES WRENCH COMPANY, Worcester, Mass., has elected officers for the year. Frank L. Coes succeeds the late Loring Coes as president and treasurer of the company; Frederick Searle is the vice-president and master mechanic, and Charles Rose, Jr., clerk; these officers, with F. W. Blackmer constitute the board of directors.

C. E. PEABODY & Co., 155 Chambers street, New York, representing several manufacturers of metal and kindred goods of house furnishing character, have recently been appointed selling representatives of the Lee Chair Company, Oneida, N. Y., which manufactures the new Reliance Mop Wringer, lately described in these columns. C. E. Peabody & Co. have the exclusive sale of this article in the Eastern and Middle States, although marketing it elsewhere as well.

THE J. H. ASHDOWN HARDWARE COMPANY, LIMITED, Winnipeg, Canada, has completed a two-story addition to its warehouse, increasing its size from four to six stories, and giving additional floor space of 17,500 sq. ft. Including the basement, the company has seven floors in this building, 135 ft. long and 130 ft. wide. To facilitate the handling of heavy Hardware new freight elevators were installed, which run from the basement to the top of the building.

THE warehouse and salesrooms of the Union Transfer Company, Omaha, Neb., wholesale Agricultural Implements, was recently destroyed by fire, entailing a loss of approximately \$100,000.

THE DURAND HARDWARE COMPANY, 370 St. James street, Montreal, Canada, is the title of a new house dealing in Builders' Hardware, Cutlery, Tools and House Furnishing Goods. Mr. Durand had been with the Jas. Walker Hardware Company, Montreal, for 22 years, having worked up to the position of assistant manager, which station he occupied before starting in business on his own account.



## IMPROVING SALESMANSHIP AND STORE SERVICE.

THE CHANDLER & FARQUHAR COMPANY, Boston, Mass., which deals in Hardware, Machinists' Supplies and Machine Tools, has adopted a system of training its employees which is working out into important beneficial results, and at the same time is the source of much pleasant experience to all concerned. A monthly dinner with a meeting is held, the entertainment being provided by the company, which bears all expenses, employees giving in return only the time devoted to an evening that is not only instructive, increasing their value in the business, but is full of social good fellowship. Each meeting is addressed by a speaker who has an intimate knowledge of some line of goods carried by the house.

The first meeting of the season had as its speakers representatives of the Norton Company, Worcester, Mass., manufacturer of Grinding Wheels made of alundum, and of the Norton Grinding Company, Worcester, builder of grinding machinery. The second meeting was addressed by a representative of the small tool department of the Brown & Sharpe Mfg. Company, Providence, and the third meeting consisted of a trip to New Bedford, Mass., where the party passed the evening inspecting the works of the Morse Twist Drill & Machine Company, all expenses being met by the Chandler & Farquhar Company.

The dinners are not elaborate, but are substantial, being patterned after the real "home" dinner. Employees are not compelled to be present; they are the invited guests of the company and may decline if they wish to do so. But naturally they are only too glad to enjoy the hospitality of the house, and to avail themselves of the valuable information imparted to them by experts in lines of goods which they have to deal with as managers, salesmen, or in other capacity.

A feature of the meetings is the part which the employees play in the proceedings. The presiding officer is one of them; each meeting elects the chairman for the next. The officers of the company are present, but remain in the background, mingling on an equal footing with the others, but always watchful to bring out best results and to see that all enjoy themselves. The audience is encouraged to ask questions of the speakers, that no obscurity may remain.

Of course such gatherings must be informal and friendly in the sense of the somewhat intimate relationship of those present, a condition which naturally becomes more pronounced on each succeeding occasion. And this suggests one result of the meetings which is already noticeable, the increase of friendliness of relations between employees in their work. To a certain extent barriers are broken down, not to the extent of undermining discipline, but in the fact that a better acquaintance brings with it a greater tolerance of the peculiarities of others. Men of different departments, who perhaps do not come into contact excepting where there is something to unravel or correct, are less apt to quarrel, to become antagonistic, when they have recently broken bread together. The contented family element of a business house is no unimportant one, for it plays its part in the *esprit du corps*, without which no business can be carried out onto its full effectiveness.

Doubtless the products of the Norton Company, the Brown & Sharpe Mfg. Company, the Morse Twist Drill & Machine Company, and of other concerns whose representatives will address the meetings during the winter, will be sold with more scientific methods, bringing greater aggregate results than would have been the case had the Chandler & Farquhar men not had the opportunity to listen to expert talks that familiarize them with details of which they might otherwise have remained in ignorance.

A large city establishment like that of the Chandler & Farquhar Company, with its large force of employees, can work out a system on a scale such as this, where the smaller merchant could not afford to do so. Yet he can apply the idea in a more modest way. For example, the salesmen of the various manufacturers whose goods the

merchant carries could tell his clerks and himself, if he sometimes acts as a salesman, as most Hardware merchants do, many of the detailed points which are important to the intelligent explanation of wares to the customer. Probably most manufacturers would be glad to co-operate in any such plan of education, for it would tend to increase the market for their goods, giving to the store that handles them an advantage over competing establishments which carry the products of rival manufacturers.

## RUDGE & GUENZEL COMPANY.

The buyers' association of the Rudge & Guenzel Company, Lincoln, Neb., enjoyed an informal banquet at the Lincoln Hotel a short time since. This association, as implied in the name, was formed by the buyers of the different departments of the establishment, and was organized for the purpose of bringing its members into close relations, for their mutual good and the benefit of the store generally. The association has a president, vice-president and secretary-treasurer, who also constitute the Executive Committee. The officers furnish the topics for discussion at the monthly meetings. These subjects not infrequently are the result of suggestion by the other buyers. Special meetings are held at the call of the Executive Committee when it is desired to take up any urgent matter of interest to the buyers in general. The association has not been long in existence, but already its good effects have been felt throughout the establishment.

Another and older organization is known as the Rudge & Guenzel Improvement Club. This comprises all the employees of the store, numbering about 165 persons. The club has a president, vice-president and secretary. Meetings are held once a month at which there is a thorough discussion of topics of interest. All of the drivers, porters, warehousemen, tinnery and sales people, as well as the officers and stockholders of the company, meet on exactly the same footing. Every one is entitled to state his or her views in regard to the subjects under consideration. The object, of course, is to improve the standard of salesmanship and the store service in general. Frequently also addresses are made by persons specially invited to speak to the members. Among these have been prominent citizens of Lincoln and manufacturers' salesmen, who have talked on the quality, construction and selling points of their goods. The Improvement Club has been in operation for more than a year, and its results have been very beneficial. This company, as will be inferred from the number of employees, carries on an extensive business, which has developed from Hardware into furniture, carpets, dry goods, &c.

ARTHUR GOODRICH has been elected president, treasurer and manager of the Taplin Mfg. Company, New Britain, Conn., to fill the vacancy created by the death of his father, Fred Goodrich, December 2, last. Mr. Goodrich was formerly vice-president of the company and has been closely identified with its management since its inception over ten years ago. An important line with the Company is the Dover Egg Beater in various sizes, from a tumbler to hotel size; also bathroom specialties and club goods, Victor garment and trousers hangers, bottle stoppers, &c. The New York office will remain as in the past, with C. E. Peabody & Co., 155 Chambers street.

SURPLESS, DUNN & Co., 74 and 76 Murray street, New York, and 68 and 70 South Canal street, Chicago, manufacturers agents, have been appointed selling representatives for all domestic territory, except the Pacific Coast, and for all export territory, of the American Logging Tool Company, Chicago, Ill. It will be remembered that the latter company, the organization of which was reported some weeks ago in *The Iron Age*, handles the output of several large manufacturers of these goods, which places Surpluss, Dunn & Co. in a position to give the trade assurance of prompt execution of all orders intrusted to them.

## A HARDWARE MERCHANT'S TRIP ACROSS THE CONTINENT.

BY A. C.

**I**N crossing the continent the large number of prosperous Hardware stores is a matter of comment. From Pittsburgh to Seattle and thence to Los Angeles these stores stand out conspicuously. The department store has not absorbed them, but in many instances the principle of the department store has been incorporated in them. Noteworthy illustrations of this are to be found in St. Louis and Buffalo.

### In Milwaukee

quite a notable feature was the lack of building operations. While the city has wide streets, good buildings of medium height, statistics show the city is falling behind its growth of previous years. The wholesale houses handle great quantities of Binder Twine and Implements for the wheat fields of Minnesota. Formerly Lumbermen's Supplies were an important feature, but the great forests of pine show nothing but the stumps. Northern Wisconsin is bare of its forests. Abandoned lumber camps and dismantled mills are now the homes of the porcupine and the trout fisherman. Land is cheap and the farmer is taking the place of the lumberman, so the trade in Agricultural Implements is growing. Milwaukee's retail stores are well stocked, somewhat light in Builders' Hardware, but making up in increased stocks of Paints and Shelf Hardware. From Milwaukee to St. Paul the country showed the effects of the thrift of the German and Swedish farmers, thus accounting in some degree for the prosperity of the Hardware dealers in this section.

### The Twin Cities

of St. Paul and Minneapolis, or as the citizens of Minneapolis claim priority, Minneapolis and St. Paul, occupy a commanding situation at the head of navigation on the Mississippi. Minneapolis is growing faster than St. Paul. The latter has an exceptionally complete Sporting Goods store. The space over the shelves, usually given over to extra stock, is devoted to handsome mounted heads of large game, extending across the front and on both sides the full length of the store, nearly 200 ft. In prominent places over the floor are complete specimens of the animals entire. The store enjoys a large tourist trade, as St. Paul is an outfitting point for hunters and fishermen on their way to the Canadian Rockies.

### The Great Wheat Fields.

A two days' ride over the Soo, a branch of the Canadian Pacific, carries one through the great wheat fields. The system of plowing indicated the reach of the country and size of the farms. Near Minneapolis the ordinary two-horse plow was used; as the country became more open the gang plow was in evidence, and as the Canadian border was approached the steam plow could be seen sending up a trail of smoke across the level plain.

### Over the Line.

At Banff, Canada, the first stopping place for the mountain tourist, there are no Hardware stores in the strict definition of the term. All the stores are what we call in the States general stores, the staples selling, as one would expect where there is but one railroad, higher than in the States, with the exception of Wire Nails, which retail the country over at 5 cents a pound. The consumer pays as much at his store in a Nail factory town as he does in an out of the way place a thousand miles from a factory.

### Vancouver and Victoria,

B. C., are two towns of which Canada may justly be proud. In both are good Hardware stores, with modern fixtures and the names of American manufacturers and jobbers on the labels of all their goods. The restless spirit was noticed here, the desire to move on—to get to the most pushing town, one dealer leaving Victoria for Vancouver, another Vancouver for Victoria. The latter was installing his fixtures and opening up his stock one even-

ing, and though his door was locked he very courteously opened it and showed us over his store. One characteristic of the Canadian shopkeeper is worthy of imitation by our brethren across the border—namely, politeness. The unfailing courtesy extended, whether one bought or not, from our Canadian friends, brought up unpleasant contrasts in treatment at the hands of our own clerks across the line.

### Seattle Was Approached

by boat from Victoria. As the boat steamed over the magnificent waterway, alive with craft of all descriptions, from the giant ship from the Orient to the pigmy pleasure launch, the city, crescent shaped, began to sparkle, as cluster after cluster of electric lights illuminated the waterfront. The spectator could not but admit that the "New York of the Pacific Coast" had some claim for its pretensions. A week was spent in Seattle, considerable time being devoted to a study of the Hardware situation. The warning sent out from all sides was that the retail Hardware business was overdone, and that the trade was controlled by the large houses located in the business center. One explanation was that the people from all over the town followed the custom of shopping in the city. Inquiry being made of a wholesale house, we secured the address of a dealer in the suburbs who wished to sell out. A trip was made to investigate. The ride, via trolley, was through an apparently growing section of the city. When his store was reached the door was found locked and a notice informed visitors that the proprietor had "gone to lunch, back at 1." The inference drawn was that suburban trade was not brisk.

The city was in a state of upheaval, showing the propensity of the American empire builder, who is so fond of his job that he builds only to tear down and build over. The ground rises sharply a few squares from the water front. So steep is the grade that electric propulsion is changed to cable, and at the top of the hills, back to electric. The streets terracing these hills were being torn up and regraded. A large brick hotel that two or three years ago was the finest in the city, stood on an eminence in the way of opening one of these new streets, and was being torn down. Everywhere there was evidence of rush and bustle.

One very noticeable feature was the crowds of idle working men. The papers were filled with accounts of the difficulties of securing labor, but around the employment offices were gathered such crowds of men gazing idly around that policemen were required to open a passageway for pedestrians. The explanation given was that all classes of labor drifted to the Northwest and would work only when their money ran out.

### Portland's Growth.

In Portland the stores showed the staid respectability of the older Eastern cities. Great stocks of Builders' Hardware are carried, as Portland is growing rapidly and putting up a good class of buildings. Portland makes the claim that she is consuming more building materials than any other city on the Coast, with the possible exception of San Francisco.

### San Francisco's Desolation.

In Oakland, across the bay from San Francisco, the most enterprising of the Hardware stores had large canvas streamers stretched across their fronts, advertising full stocks, with no advance in price on account of the calamity in the sister city. Remembering some of the large retail Hardware stores seen on a previous trip there years before, the sight of the indescribable desolation of San Francisco filled the observer with awe as he picked his way for miles among twisted iron pillars and fallen walls of what had shortly been the commercial pride of the Pacific Coast. In this condition of mind the wording of a sign on the ruins of a store on Market street, near the ferry came as an electric shock. This was partly to the effect that the firm which had formerly occupied the site had "moved quickly on account of the heat." With the nerve to smile in the face of such ruin no one will say that these men will not rebuild San Francisco.



## Important Recommendations By the P. O. Department.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., December 24, 1906.

**T**HE annual report about to be presented by Third Assistant Postmaster-General Madden contains what are decidedly the most important recommendations for legislation emanating from the Post Office Department in connection with the usual annual reports. They propose an important reduction in the postage on merchandise and also suggest the adoption of penny postage as applied to local letters.

Briefly stated, General Madden proposes a very comprehensive revision of postage rates, reducing the rate on local letters to 1 cent per ounce, abolishing the publishers' rate and providing that all printed matter shall pay at the rate of 1 cent for each 4 oz., and as an alternative proposition providing for the consolidation of third and fourth class mail matter, including printed matter (other than periodicals) and merchandise, at the rate of 8 cents per pound. If this consolidation is not agreeable to Congress General Madden suggests other alternative rates of postage on merchandise, all of which involve reductions in current rates. His recommendations, which should have the very careful attention of every retail merchant in the country, are as follows:

### What General Madden Proposes.

For the purpose of adjusting, modernizing and improving the postal service, I have the honor to recommend the following changes in the laws in relation to the classification of domestic mail matter and the rates of postage thereon, that subject being within the jurisdiction of this bureau:

1. That the rate of postage upon letters not exceeding 1 oz., deposited in any post office for local delivery by its carriers or otherwise, shall be uniform at 1 cent each; provided, that when any letter mailed at this rate requires to be forwarded to another post office for delivery the deficiency at the rate of 2 cents an ounce or fraction thereof, less the amount prepaid, shall be collected as now provided by law for other short paid letters.

2. That the seven different rates of postage for the second class and the one rate for the third class be abandoned, and in their place there be adopted a uniform rate for all printed matter of  $\frac{1}{4}$  cent per ounce, or 1 cent for each 4 oz. or fraction thereof to one address, which is 4 cents an even pound, and that there be a provision for the payment of postage on newspapers and periodicals in money as at present and another for their expeditious handling in the mails.

If a less rate than that proposed be continued or established for second-class matter then the present rate on third-class matter should continue, because it will then be necessary to place restrictions upon the second class. In that event the tests of classification or qualification for the latter class should be simplified and made to depend as much as possible upon the nature of the tangible physical thing to be transported and delivered, eliminating to the utmost all ideal distinction and collateral questions, such as now characterize and burden the laws in relation to matter of this class.

3. In the event my recommendation for the merging of the second and third classes be not adopted:

(a) That the third and fourth classes of mail matter be merged or consolidated at the rate now applicable to the third-class; or

(b) That the rate for fourth-class matter (merchandise) be fixed at 1 cent for each 2 oz. or fraction thereof on all packages not in excess of 16 oz. (1 lb.), and 1 cent for each ounce or fraction thereof on all in excess of 16 ounces in the same package; or

(c) That the rate for fourth-class matter (merchandise) be fixed at 1 cent for each ounce or fraction thereof, not exceeding 6 oz., on each package to one address, and 1 cent on each 2 oz. or fraction thereof on all in excess of 6 oz. in the same package. This proposition would make the rate of postage 11 cents on an even pound and 8 cents on each additional even pound in the same package. The Department would get the benefit of the fractions. The great majority of packages of merchandise sent in the mails being small, the effect upon the revenues would not be appreciable.

Any one of these three propositions would do away, either wholly or in some degree, with the present anomalous situation, which makes it possible to send a pound of merchandise to Germany for 12 cents, while 16 cents must be paid to send the same package to Alexandria, Va., less than 20 miles distant. If the latter of these three recommendations be adopted there should be covered into the third-class printed matter, but under existing law held to be of the fourth class.

4. That existing law be modified so as to permit, under suitable regulations, the use of ordinary postage stamps as well as special delivery stamps, the latter not always being at hand or

easily obtainable, for the purpose of securing special delivery of any letter or package. It does not seem to be necessary to limit the service, as it is now, to a particular kind of stamp. It will be a simple matter to arrange to accept ordinary stamps of the same value. The effect of such a change would be to broaden and extend the uses and convenience to the public of the special delivery service, and it would add nothing to the expenses of the Government.

### Increasing International Rate.

Doubtless anticipating the refusal or failure of Congress to reduce the rate of postage on merchandise, General Madden submits an additional recommendation, to the effect that in postal treaties that may be negotiated hereafter the international rate of 12 cents be increased to 16 cents, so that it will not be possible to send a package of merchandise from the United States to a foreign country for less than the rate charged for its transmission through the domestic mails. This suggestion is entirely sound and if acted upon will put an end to a condition that has frequently been cited as an argument in favor of the establishment of a domestic parcels post. In this connection General Madden says:

For reasons of sound postal policy I recommend a modification of the practices which have heretofore existed in regard to the fixing by treaty the conditions and rates of postage on mail matter going to and coming from foreign countries, so as to correct the present unwholesome conditions and apparent discrimination in favor of the foreign as against the domestic service.

Merchandise can be shipped from a number of foreign countries and from this country to those countries under parcels post arrangements at 4 cents a pound less than the same matter can be shipped from point to point in this country. It is difficult for the public to understand when such differences exist that we are not favoring the foreign at the expense of our domestic service, which should be not only the best but the cheapest. The discrimination, if there must be, should in future treaties favor, if possible, the domestic service; and it is my view that we should do away in the greatest possible degree with the present established inconsistencies and discriminations of more favorable rates and conditions for matter going to and coming from abroad. Uniformity is the essential thing. The other countries may adapt themselves to our system, which is the greatest and most extensive, but not ours to that of any foreign country.

### An Argument Against Parcels Post and Reduction in Merchandise Rate.

General Madden's suggestion that other countries should adapt themselves to our system and that we should not adopt theirs is, of course, a very strong argument against a domestic parcels post, and obviously it supplies Congress with a conclusive reason for refusing to reduce the postage rate on merchandise as General Madden suggests. The present international postage rates on merchandise are notoriously inadequate and are commonly regarded as of a complimentary character, representing a form of international comity. It would certainly be the height of folly to reduce our domestic rates for the purpose of bringing them into line with the unprofitable international rates.

### Merchants Should Take Action.

The House Post Office Committee will not conclude the preparation of the annual appropriation bill until after the holiday recess; in the meantime retailers should take the opportunity to acquaint their Congressmen with their views as to General Madden's numerous propositions for reducing the postage rate on merchandise, which is coming to be recognized by experts in postal affairs as promising to be of advantage only to the big catalogue houses, which would save nearly half their present outlay for postage.

W. L. C.

THOMAS RYAN, JR., has recently identified himself with J. S. Johnston & Co., 64-68 Broad street, New York, exporters of agricultural and kindred machinery for plantation and road work, pumps, windmills, &c., all over the world, the house representing directly several well-known American manufacturers in these lines. Mr. Ryan was for many years manager in New York of the George L. Squier Mfg. Company, having entire charge of the business here, and when that concern was merged with the Buffalo Forge Company several years ago he became the New York representative of the Chattanooga Plow Company. Mr. Ryan has an intimate and extensive acquaintance with the buyers of export houses in these lines, especially in New York, with whom he is deservedly popular.

## TRADE WINNING METHODS.

*This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.*

### CHRISTMAS BOOKLETS, ANNOUNCEMENTS, ETC.

**A** DAINTILY printed and attractively arranged Christmas booklet is that issued by the Odell Hardware Company, Greensboro, N. C. A Christmas greeting occupied the front cover, while all through the booklet were verses breathing the Christmas spirit. Suitable holiday gifts from a Hardware stock were grouped on separate pages devoted to gifts for father, for mother, for "the dearest girl in the world," for young men, for the Christmas bride, and for home lovers. No prices were given in the booklet, the intimation being made that these would be found reasonable and fitting the purses of shoppers.

The booklet of the Bare Bros.-Martin Hardware Company, Mansfield, Ohio, is referred to as the fifth annual

number of things there are in our store that make nice, useful, lasting, sensible Christmas gifts; to aid you in finding gifts for your friends; and to increase our Christmas business and remind you that we have a good, complete, well arranged Hardware stock offered at the right prices."

### ADVERTISEMENTS FOR THE HARDWAREMAN.

**T**HE POWERS PUBLISHING COMPANY, Norwalk, Ohio, has lately issued Volume II of "The Hardware Merchants' Advertiser," a cloth bound book of nearly 400 pages, a page with nothing on the back being devoted to each advertisement form, so that the different ads. may be cut out of the book if desired for the printer's use. Several of the advertisements are reproduced herewith with a view to showing the design and makeup. The author happily dedicates the book "to the increasing army of Hardware merchants who believe in advertising and have not forgotten that the walls of Jericho did not fall down at the first blast of the trumpet, but that the city was encompassed about many times, and the persistent tooting of their own horns was a prominent feature in the ultimate success of Joshua's army."

**DOES YOUR WIFE COMPLAIN**

About the old Cook Stove not baking as well as it used to? Is it not a fact that its best days are over and that it would please the whole family if you bought a new

**STEEL RANGE?**

We are showing some new designs that are good **BARGAINS**

**HARD & WARE**

Full Size.

**Your Wife**

Would be pleased with something from our stock of **Cutlery**. For the Holiday trade we are offering the celebrated

(Name of make you sell) **Brand**

**of Shears and Scissors**

At Special Prices

Straight or Bent Pattern Shears, 45c to 85c

Ladies' Scissors, Crocus Finish, 50c to \$1.50

Embroidery Scissors, points sharp, 40c to 75c

Manicure Scissors, handy to have, 65c to \$1.25

**Hard & Ware**

Reduced One-half.



**His First Knife**

was probably not an expensive one but it cut his finger and "hurt awfully." The boy grows to be a man wants the kind that will cut, not especially fuggers, but other things. We have all kinds of **Pocket Knives** that cut, from "10 centers" to \$3.00 each.

**Hard & Ware**

Reduced One-half.

*Specimens of Advertisements Found in "The Hardware Merchants' Advertiser."*

announcement of this sort. Early in the booklet is a page devoted to "suggestions," under which an enumeration appears of the many pleasing and useful articles which the modern Hardware establishment affords to the Christmas buyer. Some of the lines thus listed are then taken up separately and illustrated and enlarged upon.

Theo. Crowell, Kane, Pa., "The Hardwareman on the Corner," issues a neatly printed folder the front page of which extends his Christmas good wishes to the recipient. The inside of the folder enumerates some of the many articles in an up to date Hardware stock which make elegant and useful holiday gifts.

A four-page folder of poster dimensions was distributed by the Stutzman Hardware Company, Buda, Ill. A beautifully colored reproduction of Santa Claus "On the Way" occupied the first page. The other pages of this effective Christmas circular were devoted to the illustration and description, with prices, of a large assortment of goods, making admirable holiday gifts. It was announced by the company that the circular was gotten out with a threefold purpose: "To bring to your notice the large

The various forms suggested for advertisements are classified under the different branches of the Hardware business, such as Cutlery, Sporting Goods, Holiday Goods, Roofing and Tinshop Supplies, Paint and Painters' Supplies, Plumbers' Goods, House Furnishing Goods, Stoves and Furnaces, &c. The book is sold to but one dealer in a city or town and its price is \$3.50, postpaid.

### RELIANCE EDGE TOOL COMPANY.

**T**HE new plant recently erected at Youngstown, Ohio, by the Reliance Edge Tool Company is now fully equipped for the production of its line, which will include a full assortment of Chisels, Gouges and Drawing Knives. The work has been conducted under the direction of C. H. McCarty, who has had extensive experience in this department of manufacture, and all facilities have been provided for producing the highest grade of tools. The different departments have been equipped with the most modern machinery and appliances. The officers are: President, E. L. Brown; vice-president and general manager, C. H. McCarty; secretary and treasurer, G. E. Dudley; directors, E. L. Brown, C. H. McCarty, G. E. Dudley, Robert Bentley and W. A. Beecher. For the marketing of the company's output arrangements have



been made with Surpless, Dunn & Co., who will act as exclusive sales agents. This firm, which is well and favorably known, affords an Eastern and export office at 74-76 Murray street, New York, and a Western office at 68-70 South Canal street, Chicago. A price-list showing the variety of Tools manufactured by the company and containing other useful information will be distributed early in January.

## Correspondence.

### TRAVELERS' PROFIT SHARING SYSTEMS.

To the Editor: In my different visits to the jobbers in the United States I have been informed by those employing travelers on the profit sharing system that the city man gets from 17½ to 25 per cent. of gross profits and the country traveler from 30 to 40 per cent. of gross profits.

I have also read in *The Iron Age* and other trade journals a great number of opinions on this very important and interesting question of sharing of profits, and there seems to be a very general opinion, I might say unanimous opinion, that the object is better returns in the way of profits for the employer and higher salary or compensation for the employee; consequently, from the employer's standpoint it is a matter of giving to receive. With this object in view, let us see the results of the following comparison:

A is a city traveler selling \$50,000 worth of goods at 25 per cent. gross profit, or \$12,500; 25 per cent., his share of the profit, makes \$3125, leaving a profit of \$9375 to the employer.

B is a country traveler selling same amount at same profit, but he gets 40 per cent. for profit sharing, equal to \$5000, leaving a gross profit of only \$7500 to the employer.

The employer thus gets from his city man \$1875 more profit, and by allowing \$1000 for travelling expenses the country traveler receives \$875 more, notwithstanding the fact that his living expenses are less when he is traveling, his board coming out of the \$1000.

Moreover, the city salesman is only credited with the orders he himself takes; on the other hand, the country traveler is usually credited with direct sales and mail orders in his territory.

This surely demonstrates that city business is more productive for the house, while we also know our city accounts better and they are more easily collected.

If a man with a prospect offered you for the same money a share of 60 per cent. because it would be a country bargain and 75 per cent. because it would be a city affair, would you not naturally ask yourself what has the location to do to make this difference? Hence my inability to see why a city traveler should receive only 25 per cent. and the country traveler 40 per cent.

When you subscribe stock in a company is it not a fact that dividends are only declared on the net profits after all expenses are paid? The same rule applies in ordinary partnership. Why should not the same application be made in a profit sharing proposition with travelers.

The volumes of business of a traveler should be charged with a corresponding percentage of the amount of expenses of administration, to be deducted from gross profits. To make my views clear, I submit the following example:

C sells \$100,000 on a margin of 14 per cent., or \$14,000. Gross profits at 40 per cent. profit sharing amount to \$5,600.

D is also a country traveler, but devotes all his energies to the sale of the most profitable goods, and only secures \$50,000 of business at 25 per cent., or \$12,500 gross profits, which, at 40 per cent. profit sharing amount to \$5,000.

All will admit that D is the better man, the one that obliges you to carry less stock, involving less handling, less cost of administration and less risk of credit. Still C receives \$600 more than D.

Is this to the advantage of the employer? I do not hesitate to say no.

On the other hand, if you base the profit sharing on the net profits, the result would not be the same. The traveler selling \$100,000 worth of goods would pay for administration expenses double the amount of the one that sold \$50,000 worth, which is only just.

#### The Two Methods Compared.

Let us now compare the two methods:

*On the basis of gross profits.*

A sold \$100,000 worth at 14 per cent. = \$14,000 at 40 per cent. = \$5,600.

B sold \$50,000 worth at 25 per cent. = \$12,500 at 40 per cent. = \$5,000.

*On the basis of net profits.*

A sold \$100,000 at 14 per cent. = \$14,000.

Less 7 per cent. for expenses = \$7,000.

Leaving \$7,000 at 40 per cent. = \$2,800.

B sold \$50,000 at 25 per cent. = \$12,500.

Less 7 per cent. for expenses = \$3,500.

Leaving \$9,000 at 40 per cent. = \$3,600.

Does it not appeal to you that the man who brings the better percentage is the better man and should get the greater remuneration?

A difference should be made for percentage of expenses on direct shipments from factories and shipments from one's own warehouses. I, therefore, cannot see why percentage should be allowed on gross profits. The 7 per cent. referred to includes all expenses of administration, except those of the selling staff, whether indoor or outdoor.

Considering the facts above referred to, I cannot see the reasons why:

1st. A city traveler should only be entitled to 17½ to 25 per cent. of the gross profits when the country traveler is receiving 30 to 40 per cent.

2d. Why the sharing of profits is based on the gross profits instead of on the net profits.

I think the views of your readers on this very important subject would be interesting.

FRED. C. LARIVIERE.

MONTREAL, December 11, 1906.

### CALENDARS, Etc.

EMIL CALMAN & Co., 100 William street, New York: Calendar calling attention to the company's products.

JOHN ROURKE & SONS, Savannah, Ga.: Handsome art calendar with monthly sheets.

McKINNEY MFG. COMPANY, Allegheny, Pa.: Vest pocket memorandum book and diary for 1907.

ALMON H. FOGG COMPANY, Houlton, Maine: Calendar with monthly sheets advertising the various lines sold by the company.

REPUBLIC IRON & STEEL COMPANY, Pittsburgh, Pa.: Daily sheets for desk pad calendar.

ROE & CONOVER, Newark, N. J.: Pocket memorandum calendar for 1907.

HENDRICKS BROTHERS, 49 Cliff street, New York: Pocket calendar and memorandum book.

SHIBLEY RADIATOR & FOUNDRY COMPANY, Indianapolis, Ind.: Calendar with weekly sheets.

ASHTON VALVE COMPANY, Boston, Mass.: Calendar calling attention to the company's branch houses and agencies.

JOHN MACKEY & SON, South Haven, Mich.: Attractive calendar with monthly sheets.

D. T. WILLIAMS VALVE COMPANY, Cincinnati, Ohio: Large calendar with weekly sheets.

INTERNATIONAL BOILER WORKS COMPANY, East Stroudsburg, Pa.: Art nouveau calendar with monthly sheets.

MORRIS MACHINE WORKS, Baldwinsville, New York: Attractive calendar with monthly sheets.

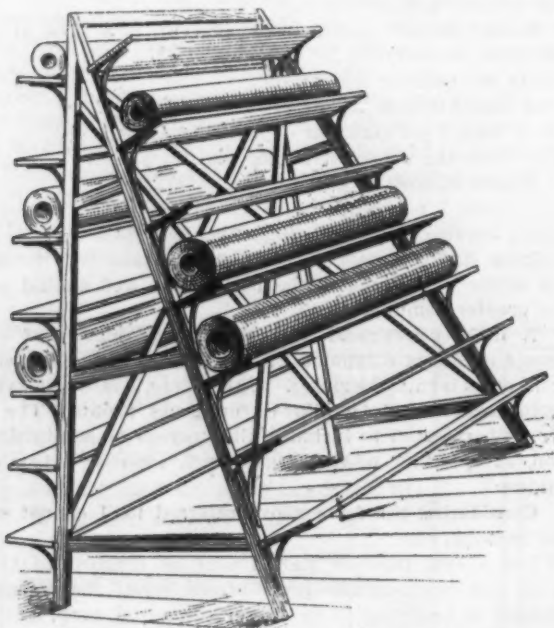
C. W. LEAVITT & Co., 220 Broadway, New York: Calendar calling attention to the lines handled by the firm.

W. & S. MFG. COMPANY, Worcester, Mass.: Nature print bearing calendar in monthly sheets.

DE CAMP BROS. & YULE IRON, COAL & COKE COMPANY, St. Louis, Mo.: Calendar with monthly sheet illustrated with foundry scene.

### A HOME MADE SCREEN WIRE RACK.

FOR advices in regard to the inexpensive and convenient Screen Wire Rack, illustrated herewith, we are indebted to William Kempf, 2814 Manchester avenue, St. Louis, Mo., who, after trying various ways of keeping cut rolls of Wire Cloth, made a rack of this form. This style of Rack can be constructed to carry any number of rolls of Wire, green on one side and black on the other. A Rack of desirable proportions to accommodate Screen from 22 to 48 in. in width, of two colors, can be built as



A Home Made Screen Wire Rack.

follows: The uprights should be  $1\frac{1}{2}$  in. thick,  $2\frac{1}{4}$  in. wide and  $7\frac{1}{2}$  ft. long, put together A shaped. The uprights should be 20 in. apart at the top and 34 in. at the bottom, held together by three cleats at each end and stiffened by cross cleats top and bottom, so that the Rack will stand perfectly rigid. Japanned iron shelf brackets should be placed  $6\frac{1}{2}$  in. apart on the uprights and to the brackets secured  $\frac{1}{2}$ -in. boards 6 in. wide, the same length as the respective rolls of Wire, forming shelves on which to place the rolls. With this arrangement the rolls of Wire lying on the shelves are never damaged, and the edges of the Cut Wire do not lacerate the hands if the rolls are properly placed.

### Louden's Litter Carriers.

Louden Machinery Company, Fairfield, Iowa, is offering the feed and litter carriers shown herewith. The new

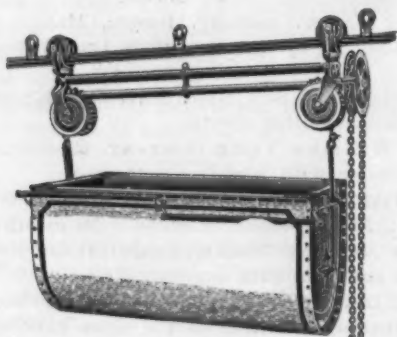


Fig. 1.—Louden's Standard Litter Carrier No. 720.

worm gear shown in Fig. 1 permits a pound pull on the chain to lift 40 lb. in the box, so that a boy can hoist  $\frac{1}{2}$  ton easily. The box, when loaded, is referred to as not

dropping down, but staying where it is placed. The chain is pulled one way to raise the box and the other way to let it down. The gear is made so as to relieve the friction and make it run easily. Special flexible wire cables are used to wind on the hoisting drums, and the hoisting chain and wheel are made of the best material. The box is constructed of heavy galvanized sheet steel, reinforced at top and ends by angle irons, the whole being soldered and riveted together to make it water tight and substantial. It is latched to the hangers at both ends, the latches being connected together and released instantaneously to let the box tip and discharge its contents. It can be easily and quickly righted with a fork or shovel without touching with the hands. The self-acting litter carrier,

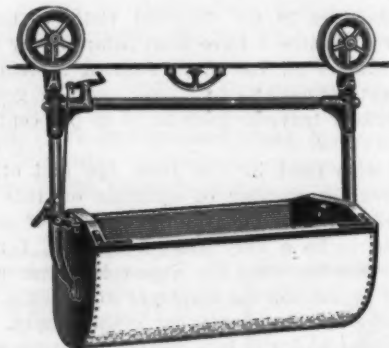


Fig. 2.—Louden's Self-Acting Litter Carrier.

Fig. 2, has wheels mounted upon yokes which are swiveled in the main frame so as to turn freely in any direction. The yokes are fitted with keepers to effectively prevent stock hooking the carrier off the track while hanging in the yard. A spring end stop not only prevents the wheels jumping the track, no matter how hard the carrier may be run, but also starts it back on its return trip. A good steady shove will send the loaded carrier out 100 ft. or more, where it will dump itself at the proper place and then return to the stable of its own momentum without danger of getting off the track. The trip stop is adjustable, and can be moved along the track to any desired point for dumping. The carrier can be made to run on a three-way switch. These overhead carrier systems are adapted to use in warehouses, store buildings, &c., as well as in large barns.

### The Daisy Hand Plow.

W. C. Heller & Co., Montpelier, Ohio, are putting on the market the hand plow shown herewith. It is built



The Daisy Hand Plow.

of steel, with steel wheel 24 in. high, with  $1\frac{1}{4}$ -in. tire, steel spokes and steel axle. Independent steel braces are designed to give the greatest solidity, besides being adjustable. The attachments include a 4 x 8 in. hoe, 2 x 8 in. shovel or bull tongue, T-weeder or scuffing hoe, mold board, three-blade attachment and rake or weeder.



### Trident Tires.

Fig. 1 of the accompanying illustrations shows the Trident tire, made by Trident Tire Company, 100 Broadway, New York, and invented by John Thomson of the John Thomson Press Company, New York. The cut shows the flat tread type, grooved, to be used on rear wheels; front wheel tires are round with smooth tread. The highest excellence in material and mechanical construction is claimed for this tire insuring, it is said, the utmost degree of strength and durability. It is a built-up



Fig. 1.—Sectional View of Trident Tire, Flat Thread Type.

tire, the foundation of which is a woven fabric peculiarly frictioned and treated to make it exceedingly adherent, tough and strong. Each thread of the fabric is protected by a layer of pure rubber from chafing against any other thread, reducing the wear to a minimum and obviating internal abrasion between the threads of the fabric and also between the layers of it. The inner tube is vulcanized endlessly with no cemented or lapped joint, and is made of pure gum rubber of the highest degree of density, ductility and tenacity. The detachable Trident rim shown in Fig. 2 may be used with any clincher tire, is adapted to any standard wheel and can be easily and quickly applied. All parts are rolled from mild steel, electrically welded and electro-galvanized to prevent cor-

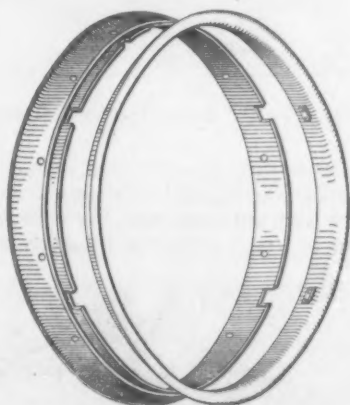


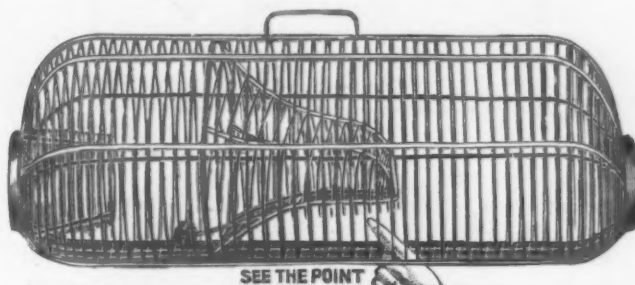
Fig. 2.—Detachabale Trident Rim.

rosion. Trident tires, it is declared, cannot be torn from the felly by any cause, whether inflated or deflated. They cannot be torn from the rim by side roll, puncture or blow out. There is a limit stud under the bolt which gives a solid metallic bearing for the head and clip and prevents crushing the wooden felly. Every portion of the inner tube is above the level of the flange, so that it

cannot be pinched, and even when partially or entirely deflated there is no danger of the rim cutting, as the casing can only come in contact with the solid rubber base without chafing against the flange. The broad, shallow, peripheral grooves, sharp edged outside, rounded at bottoms, afford a high degree of strength and adherence, resisting side skidding and presenting a large area of bearing surface. The company asserts that these tires cannot roll or creep or in any way injure the valve or inner tube. It is stated that in service the tires require only about half the air pressure usually necessary in pneumatics, and they are guaranteed against puncture and rim cutting for six months.

### Hold-Em Rat Trap.

Herewith is illustrated a new rat trap which is made by the Worcester Wire Novelty Company, Canton, Ohio. It operates on a principle with which the trade is familiar, its distinctive feature being that there is no fine lacing wire used in its construction. The ribs are made of two strips of metal, one having notches cut in it to



Hold-Em Rat Trap.

receive the wire and being bound around the other strip and over the wire. The company asserts that it is impossible to displace the wires of this trap. The nose of the trap has short wires extending down below the trap door to prevent the rat from pulling the door down and getting out.

### Buffalo Forge No. 10.

An improved construction of forge No. 10 is shown herewith as manufactured by the Buffalo Forge Company, Buffalo, N. Y. It has an interior construction not



Buffalo Forge No. 10.

materially unlike the mechanism of the company's direct drive blower No. 306, but having a little clutch instead of the ratchet motion. The horizontal cross section is semi-elliptical. The handle is fastened by a chain so it can be detached when shipping and not get lost. With the handle slipped out of the socket and inside the casing, the dash hood lowered, and the cover padlocked to the barrel of the forge by a hasp provided, the smith's tools are safe from being stolen during the night should the forge be used for out of door work.

### Sherwood Metal Frame Window Screen.

Sherwood Metal Working Company, Syracuse, N. Y., is manufacturing the all metal screen here shown. It has a sheet steel frame finished with best black baking japan. The wire cloth, which is said to be of the highest grade, is pressed into the frame, as shown in Fig. 2, so that it

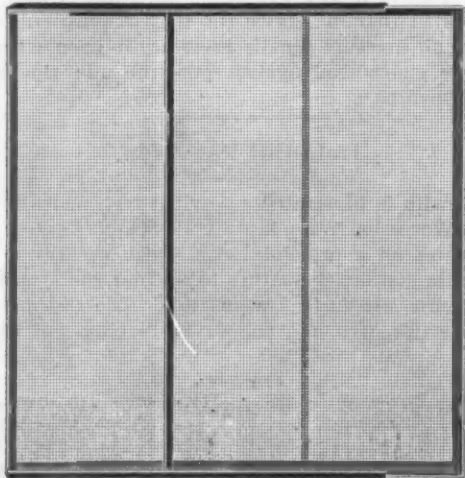


Fig. 1.—Sherwood Metal Frame Window Screen.

cannot loosen or sag. Not a rivet is used in the construction. These screens can be used as extension screens or as stationary outside screens, operation being explained in detail by printed instructions furnished with each. The company calls attention to the fact that being made of metal the screens are impervious to moisture and are not affected by changes in temperature, while they are also strong, durable and have a neat appearance which they retain. It is also declared that they are no more expensive than good wooden screens, and render service

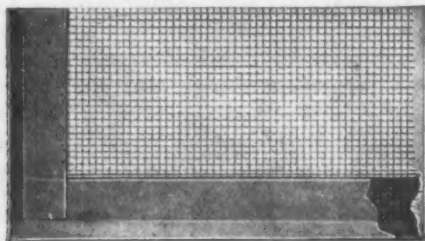


Fig. 2.—Method of Fastening Wire Cloth.

out of all proportion to their cost. Sherwood metal frame screens are packed 1 doz. in a crate, and are carried in stock ready for shipment in the following sizes: 18 in. high, adjusts 22 to 33 in., weight 30 lb.; 24 in. high, adjusts 22 to 33 in., weight, 35 lb.; 30 in. high, adjusts 24 to 37 in., weight, 40 lb.

### Carpet Clamp and Broom and Dust Pan Holder.

Two household specialties made by E. E. Josef Mfg. Company, Buffalo, N. Y., are illustrated in the accompanying cuts. Fig. 1 represents the Buffalo carpet and



Fig. 1.—Buffalo Carpet and Rug Clamp.

rug clamp, used to clamp carpets, rugs, portieres, &c., to a line when hanging them out to beat or air them. It

may also be used to advantage in a showroom in connection with a rope or wire to hang up rugs, &c., for display. The device, which is made of coppered metal, is in the shape of a hook having jaws at the end of the



Fig. 2.—Acme Broom and Dust Pan Holder.

shank which are operated by a spring and thumb piece formed by the hook. The clamp is so devised that any weight hung from it only tends to fasten the jaws more securely. The Acme broom and dust pan holder, Fig. 2, is also made of coppered metal. It may be screwed up about 5 or 6 ft. above the floor in some convenient place and enables the housewife to hang her broom by the handle and her dust pan with it. This not only affords a place for these articles, but prevents the broom from getting out of shape standing on the floor.

### "It" Mouse Trap.

Abingdon Trap Company, Abingdon, Ill., has added to its large line of mouse and rat traps the "It" trap, two views of which are given herewith, Fig. 1 being a

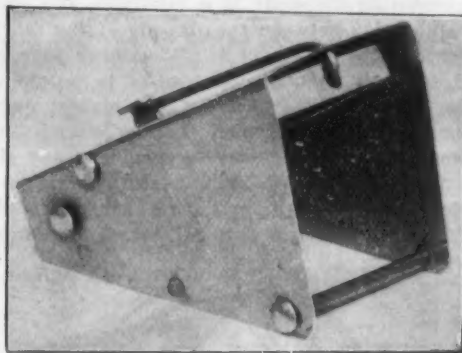


Fig. 1.—"It" Mouse Trap, Actual Size.

full size view showing how the trap is made. The trap is of the choker variety and is of minimum size, but is said to catch and kill instantly. As it is entirely open in front and has no bottom the mouse is not afraid to

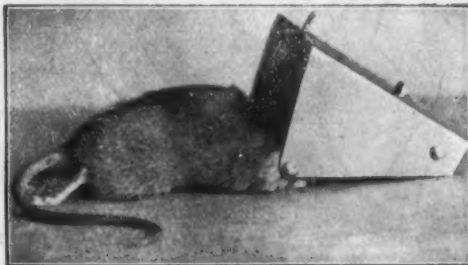


Fig. 2.—"It" Mouse Trap in Operation.

take the bait. It is made entirely of metal and does not become foul from use. "It" traps are packed five gross in a case, which weighs 40 lb.



## Bike and Trike Coasters.

Hunt, Helm, Ferris & Co., Harvard, Ill., manufacturers of Star coaster wagons, &c., are just putting on the market the new line of two and three wheel coasters shown in the accompanying cuts. Fig. 1 illustrates the Bike coaster which is something novel in the way of wheel vehicles and is intended particularly for boys. The three



Fig. 1.—Bike Coaster.

wheel Trike coaster, Fig. 2, is adapted equally to the use of boys and girls. All of the wheels used on these coasters have roller bearings, reducing the friction to a minimum. The front, or steering wheel, is kept in a rigidly straight position by the use of a spring, unless otherwise directed by the operator. The Bike coaster and the No. 1 Trike coaster are equipped with a brake in the form of an eccentric, which attaches to the front axle and



Fig. 2.—Trike Coaster No. 1.

which when slightly turned by the operator instantly brakes the coaster to any desired extent. The No. 2 Trike coaster, Fig. 3, is identical in construction with the No. 1 three wheeler, except that the No. 2 is furnished with a steering handle and rear hand brake, so that the operator can drive the coaster while sitting in an upright position. The 11-in. wheels used on these coasters are the same as the wheels used on the well-known Star

coaster wagons and are practically indestructible. It will be noted that these coasters are simple in design and



Fig. 3.—Trike Coaster No. 2, with Handle.

construction and the manufacturers advise that they are very reasonable in price.

## Rockwell Foundry Riddle.

The new foundry riddle shown herewith is the product of S. Obermayer Company, Cincinnati, Ohio. Its special feature lies in the strips of 1-in. galvanized iron used to bring together the ends of the rims and drivers which lap opposite each other, thus affording protection and strength at what is usually the weakest point of an article of this kind. The strips are bound over the point



Rockwell Foundry Riddle.

where the rims and drivers lap and act as extra braces, while at the same time holding the wire cloth securely. The same binding is done at the inside lap of the rim and where the ends of the liners lap. The rims are of seasoned elm, the bottoms are finished with 3/4-in. liner, while the drivers are 2 1/2 in. wide. The riddle is 4 in. deep by 16 1/2 in. wide, inside measurements, and 4 1/4 in. deep by 18 in. wide outside.

## PAINTS, OILS AND COLORS

## Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	42	@43
City, Boiled.....	43	@44
State and Western, raw.....	41	@42
Raw Calcutta, in bbls.....	70	@
Lard, Extra Prime, Winter.....	77	@78
Extra No. 1.....	80	@81
No. 1.....	84	@85
Cotton-seed, Crude, f.o.b. mills.....	42 1/2	@43 1/4
Summer Yellow, Prime.....	42 1/2	@43 1/4
Summer White.....	43	@44
Sperm, Crude.....	52	@53
Natural Winter.....	55	@56
Bleached Winter.....	58	@59
Bleached Winter, Extra.....	70	@72
Tallow, Prime.....	55	@56
Whale, Crude.....	55	@56
Natural Winter.....	45	@46
Bleached Winter.....	47	@48
Extra Bleached Winter.....	49	@50
Mechaden, Brown, Strained.....	29	@32
Light, Strained.....	29	@32
Northern.....	28	@
Southern.....	27	@
Cocoonut, Ceylon.....	34	@35
Cochin.....	34	@35
Cod, Domestic, Prime.....	30	@35
Newfoundland.....	34 1/2	@42
Red, Elaine.....	45	@48
Saponified.....	45	@48
Olive, Italian, bbls.....	65	@68
Nestfoot, Prime.....	49	@50
Palm, Logos.....	17	@17 1/2

## Mineral Oils—

Black, 29 gravity, 2500 cold test.....	10 1/2	@11 1/4
29 gravity, 15 cold test.....	11 1/2	@12 1/4
Summer, light filtered.....	18 1/2	@19 1/4
Cylinder, light filtered.....	18	@19
Dark, filtered.....	16	@17
Paraffine, 903-907 gravity.....	13 1/4	@14
903 gravity.....	12 1/4	@13
905 gravity.....	10 1/4	@10 1/2
Red.....	12 1/4	@14

## Miscellaneous—

Barytes:		
White, Foreign.....	1 ton	\$18.50@20.00
Amer. floated.....	1 ton	19.00@
Off color.....	1 ton	11.50@15.50
Chalk, in bulk.....	1 ton	3.00@3.25
In bbls.....	100 lb	.35
China Clay, English.....	1 ton	11.00@17.00
Cobalt, Oxide.....	100 lb	2.50@2.60
Whiting, Commercial.....	100 lb	.43
Gilders.....	100 lb	.50@.55
Ex. Gilders.....	100 lb	.55@.60
Putty, Commercial.....	100 lb	
In bladders.....	100 lb	\$1.70
In bbls, or tubs.....	100 lb	1.20
In 1 lb to 5 lb cans.....	100 lb	2.65
In 12 1/2 to 50 lb cans.....	100 lb	1.50
Spirits Turpentine.....	100 lb	
In Oil bbls.....	100 lb	.69
In machine bbls.....	100 lb	.70
Glue—		
Cabinet.....	100 lb	.11
Common Bone.....	100 lb	.07
Extra White.....	100 lb	.18
Foot Stock, White.....	100 lb	.11
Foot Stock, Brown.....	100 lb	.08
German Hide.....	100 lb	.12
French.....	100 lb	.13
Irish.....	100 lb	.13
Low Grade.....	100 lb	.09
Medium White.....	100 lb	.14
Gum Shellac—		
Bleached Commercial.....	100 lb	.47
Bones, Dried.....	100 lb	.57
Button.....	100 lb	.40
Diamond I.....	100 lb	.85
Fine Orange.....	100 lb	.52
A. C. Garnet.....	100 lb	.47
Kala Button.....	100 lb	.37
G. A. L. Garnet.....	100 lb	.45
D. C. Garnet.....	100 lb	.59
Octagon B.....	100 lb	.64
T. N.....	100 lb	.48
T. S. O.....	100 lb	.49
Colors in Oil—		
Black, Lampblack.....	100 lb	.12
Blue, Chinese.....	100 lb	.36
Blue, Prussian.....	100 lb	.32

Blue, Ultramarine.....	100 lb	.13
Brown, Vandyke.....	100 lb	.11
Green, Chrome.....	100 lb	.12
Green, Paris.....	100 lb	.24
Sienna, Raw.....	100 lb	.12
Sienna, Burnt.....	100 lb	.12
Umber, Raw.....	100 lb	.11
Umber, Burnt.....	100 lb	.11

## White Lead, Zinc, &amp;c.—

Lead, American White:		
Lots of 500 lb or over, in Oil ..	7	@
Lots less than 500 lb, in Oil ..	7 1/4	@
Dry in Barrels.....	6 1/2	@
Lead, English white, in Oil.....	9 1/2	@10
Lead, White, in oil, 25 lb tin		
pails, add to keg price.....	1/4	@
Lead, White, in oil, 12 1/2 lb tin		
pails, add to keg price.....	1	@
Lead, White, in oil, 1 to 5 lb		
ass'ted tins, add to keg price ..	1 1/4	@
Lead, American, Terms: For lots 12		
tons and over 1/4¢ rebate; and 2% for		
cash if paid in 15 days from date of		
invoice; for lots of 500 lbs. and over		
2% for cash if paid in 15 days from		
date of invoice, for lots of less than		
500 lbs. net.....	5 1/2	@
Zinc, American, dry.....	5 1/2	@
Zinc, French:		
Antwerp, Red Seal, dry.....	8 1/2	@
Antwerp, Green Seal, dry.....	10 1/2	@
Paris, Red Seal, dry.....	9 1/2	@
Paris, Green Seal, dry.....	11	@
Zinc, V. M. French, in Poppy Oil:		
Green Seal:		
Lots of 1 ton and over.....	13 1/4	@13 1/2
Lots of less than 1 ton.....	13 1/2	@13 1/4
Zinc, V. M. French, in Poppy Oil:		
Red Seal:		
Lots of 1 ton and over.....	11 1/4	@11 1/2
Lots of less than 1 ton.....	12 1/4	@12 1/2
Discounts—French Zinc—Discounts		
to buyers of 10 bbl. lots of one or mixed		
grades: 1%: 25 bbls., 2%: 50 bbls., 4%:		
Dry Colors—		
Black, Carbon.....	4 1/2	@11
Black Drop, American.....	4	@6
Black Drop, English.....	5	@15

Black, Ivory.....	16	@20
Lamp, Com.....	4	@6
Blue, Celestial.....	4	@6
Blue, Chinese.....	29	@32
Blue, Prussian.....	27	@30
Blue, Ultramarine.....	4 1/2	@15
Brown, Spanish.....	4 1/2	@1
Carmine, No. 40.....	33.00	@3.25
Green, Chrome, ordinary.....	3 1/2	@6
Green, Chrome, pure.....	17	@25
Lead, Red, bbls., 1/2 bbls. and kegs:		
Lots 500 lb or over.....	7 1/4	@
Lots less than 500 lb.....	7 1/2	@
Litharge, American, bbls.....	7 1/4	@7 1/2
Ocher, American.....	10	@16.00
American Golden.....	2 1/4	@3 1/2
French.....	1 1/4	@2
Foreign Golden.....	3	@4
Orange Mineral, English.....	10	@12
French.....	10 1/2	@12
German.....	10 1/2	@10
American.....	8 1/4	@8 1/2
Red, Indian, English.....	4 1/2	@8 1/2
American.....	3	@3 1/4
Red, Turkey, English.....	4	@10
Red, Tuscan, English.....	7	@10
Red, Venetian, Amer.....	100 lb	\$2.50@1.25
English.....	100 lb	\$1.15@1.15
Sienna, Italian, Burnt and		
Powdered.....	3	@9 1/2
Italian, Raw, Powdered.....	3	@9 1/2
American, Raw.....	1 1/4	@2
American, Burnt and Pow'd.....	1 1/4	@2
Talc, French.....	10	@17.00@25.00
American.....	10	@17.00@25.00
Terra Alba, French.....	100 lb	.90@1.00
English.....	100 lb	.90@1.00
American.....	100 lb	.75@.80
American.....	100 lb	.60@.65
Umber, T'kev. Bnt. & Pow.....	2 1/4	@3 1/4
Turkey, Raw and Powdered.....	2 1/4	@3 1/4
Burnt, American.....	1 1/4	@2
Raw, American.....	1 1/4	@2
Yellow Chrome.....	12	@14
Vermilion, American Lead.....	10	@25
Quicksilver, bulk.....	5	@65
Quicksilver, bags.....	5	@70
Chinese.....	20.50	@21.00

# Current Hardware Prices.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33½ @ 33½ & 10% signifies

that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00.....33½%  
North's.....10%  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent.....35%  
Taplin's Perfection.....35%

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers,  $\frac{1}{2}$  doz. pairs, Nos. 1, \$0.75; 2, \$0.60; 4, \$1.00; 5, \$0.50.  
Fernald Quick Shifter,  $\frac{1}{2}$  doz. pairs.....\$2.00@3.00

## Anvils—American—

Eagle Anvils..... $\frac{1}{2}$  lb. @ 64¢  
Hay-Budden, Wrought..... $\frac{1}{2}$  lb. @ 94¢  
Trenton..... $\frac{1}{2}$  lb. @ 94¢

## Imported—

Peter Wright & Sons,  $\frac{1}{2}$  lb. 84 to 249 lb. 11¢; 350 to 600 lb. 11¢.  
Anvil, Vise and Drill—  
Millers Falls Co., \$13.00.....154½%

## Apple Parers—See Parers, Apple, &c.

## Aprons, Blacksmiths'—

Livingston Nail Co.....33½%

## Augers and Bits—

Com. Double Spur.....75@75½10%  
Jennings' Patn., reg. finish.....60½@60½10%  
Black Lip or Blued.....65@65½

Boring Attach. Augers.....70½10%  
Car Bits, 12-in. twist.....50½10%  
Ford's Auger and Car Bits.....40½%  
Ft. Washington Auger Co., Concord's.....35%  
Forstner Pat. Auger Bits.....25%  
C. E. Jennings & Co.:  
No. 10 ext. lip, R. Jennings' list.....25%  
No. 30, R. Jennings' list.....40½10%  
Russell Jennings.....25½10½2%

L'Hommedieu Car Bits.....10%  
Mayhew's Countersink Bits.....40%  
Pugh's Black.....25%  
Pugh's Jennings Pattern.....25%  
Snell's Auger Bits.....60%  
Snell's Bell Hangers Bits.....60%  
Snell's Car Bits, 12-in. twist.....60%  
Snell's King Auger Bits.....50%  
Wright's Jennings' Bits.....50%

## Bit Stock Drills—

See Drills, Twist.

## Expansive Bits—

Clark's small,  $\frac{1}{8}$  in. large, \$3.....50½10%  
Clark's Pattern, No. 1,  $\frac{1}{2}$  doz. \$2.....50½10%  
No. 2,  $\frac{1}{8}$  in. large, \$1.....60½10%  
Ford's Clark's Pattern.....60%  
C. E. Jennings & Co., Steer's Pat. 25.  
Lavigne Pat., small size, \$18.00.....70½10%  
Swan's.....60%

## Gimlet Bits—

Common Dble. Cut.....\$3.00@3.25  
German Pattern, Nos. 1 to 10, \$4.75; 11 to 13, \$5.75

## Hollow Augers—

Bonney Pat., per doz. \$5.50@6.00  
Inches.....25½10%  
Universal.....25%  
Wood's Universal.....25%

## Ship Augers and Bits—

Ship Augers.....45½@45%  
Ford's.....35½45%  
C. E. Jennings & Co.:  
L'Hommedieu's.....15%  
Watrous'.....35½47%  
Snell's.....40%

## Awl Hatts—See Handles, Mechanics' Tool.

## Awls—

Brad Awls:  
Handled.....gro. \$2.75@3.00  
Unh'd, Sh'dered.....gro. 65@66½  
Unh'd, Patent.....gro. 66@70½  
Peg Awls:  
Unh'd, Patent.....gro. 31@34½  
Unh'd, Sh'dered.....gro. 65@70½  
Scratch Awls:  
Handled, Com.....gro. \$3.50@4.00  
Handled, Socket.....gro. \$11.50@12.00

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

Single Bit, base weights: Per doz.  
First Quality.....\$1.75@5.00  
Second Quality.....\$1.25@2.50  
Double Bit, base weights:  
First Quality.....\$7.00@7.50  
Second Quality.....\$6.50@6.75

## Axle Grease—

See Grease, Axle

## Axles—

Concord, Loose Collar.....4½@5%  
Concord, Solid Collar.....4½@5½4%  
No. 1 Common, Loose.....3½@4%  
No. 1½ Com., New Styles.....4½4%  
No. 2 Solid Collar.....3½@4½4%

Half Patent:  
Nos. 7, 8, 11 and 12.....70@75%  
Nos. 13 to 14.....70@75%  
Nos. 15 to 18.....75@75½5%  
Nos. 19 to 22.....75@75½5%

## Boxes, Axle—

Common and Concord, not turned lb., 4½@5%  
Common and Concord, turned lb., 5½@6%  
Half Patent.....lb., 9½@10½

## Bait—

Hendryx:  
A Bait.....20%  
B Bait.....25%  
Competitor Bait.....20½4%

## Balances—

Caldwell new list.....50%  
Fullman.....50½@60%

## Spring—

Spring Balances.....50½10@80%  
Chattillon's:  
Light Sps. Balances.....50½10%  
Straight Balances.....40@50%  
Circular Balances.....50½10%  
Large Dial.....30%

## Barb Wire—See Wire, Barb.

## Bars—

Steel Crowbars, 10 to 40 lb. per lb., 3@3½4%

## Towel

No. 10 Ideal, Nickel Plate..... $\frac{1}{2}$  gro. \$8.50

## Beams, Scale—

Scale Beams.....40%  
Chattillon's No. 1.....40%  
Chattillon's No. 2.....40%

## Beaters, Carpet—

Holt-Lyon Co.:  
No. 12 Wire Coppered  $\frac{1}{2}$  doz. \$0.80;  
Tinned.....\$0.85  
No. 11 Wire Coppered  $\frac{1}{2}$  doz. \$1.15;  
Tinned.....\$1.20  
No. 10 Wire Tinned..... $\frac{1}{2}$  doz. \$1.50

Western W. G. Co.:  
No. 1 Electric..... $\frac{1}{2}$  gro. \$7.80  
No. 2 Buffalo..... $\frac{1}{2}$  gro. \$9.00  
No. 3 Perfection Dust..... $\frac{1}{2}$  gro. \$8.00

## Egg—

Holt-Lyon Co.:  
Holt, per doz. No. 5, Jap'd, \$0.80;  
\$0.80; No. 7, Jap'd, \$1.15; No. 8, Jap'd, \$1.35; No. 6, Jap'd, \$1.05.  
Lyon, Jap'd, per doz., No. 2, \$1.35.

Taplin Mfg. Co.:  
Improved Dover, per gro. No. 60, \$8.00; No. 75, \$9.00; No. 100, \$7.00;  
No. 122, Tin'd, \$8.50; No. 150, Hotel, \$15.00; No. 182, Hotel Tin'd, \$17.00; No. 200, Tumbler, \$8.50; No. 202, Tumbler Tin'd, \$9.50; No. 300, Mammoth, per doz., \$25.00.

Turner & Seymour Mfg. Co.:  
T. & S. Dover.....\$6.00  
Western W. G. Co.  $\frac{1}{2}$  gro., Buffalo, No. 2, \$8.00; Perfection, No. 3, \$9.00.

Wonder (R. M. Co.)  $\frac{1}{2}$  gro. net, \$6.25

## Bellows—

Blacksmith, Standard List.....65%  
Split Leather.....65%  
Grain Leather.....60%

Hand—  
Inch.....6 7 8 9 10  
Doz.....\$5.50 6.15 6.80 7.15 7.70

Molders—  
Inch.....9 10 11 12 14  
Doz.....\$8.00 9.00 10.50 12.50 14.50

## Bells—Cow—

Ordinary Goods.....75½@75½10½5%  
High grade.....70½10@75%  
Jersey.....75½10%  
Texas Star.....50%

## Door—

Albhe's Gong.....45%  
Barton Gong.....50%  
Home, R. & E. Mfg. Co.'s.....55½10%  
Trip Gong.....80½10@90½10½5%  
Yankee Gong.....50%

## Hand—

Polished, Brass.....60½10%  
White Metal.....60%  
Nickel Plated.....80½10@60%

Swiss.....50½10@50½10½5%  
Cous's Globe Hand Beas.....33½10@30%  
Silver Chime.....33½10@30%

## Miscellaneous—

Farm Bells.....lb., 2½@2½4%  
Church and School.....60%  
Table Call Bells.....60½10@60%  
Belting—Leather—

Extra Heavy, Short Lap.....69½5%  
Regular Short Lap.....60½10½5%  
Standard.....70%  
Light Standard.....70½5%  
Cut Leather Lacing.....45%  
Leather Lacing Sides, per sq. ft. 25¢

## Rubber—

Agricultural (Low Grade).....75@75½5%  
Common Standard.....70@70½10%  
Standard.....60½10@60½10%  
Extra.....60@60½5%  
High Grade.....60½10@60½10%

## Bench Stops—

See Stops, Bench

## Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%  
Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$1.25; No. 2, \$7.25;  
No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.

Green River Tire Benders and Upsetters.....20%

## Bicycle Goods—

John S. Lang's Son & Co.'s 1906 list:  
Chain, Parts, Spokes.....50%  
Tubes.....60%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

## Blocks—Tackle—

Common Wooden.....75%  
Hartz St. Tackle Blocks.....50@50½5%  
R. & L. B. Co.:  
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50½10%  
Star Wire Rope, 80%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50½10%  
Wire Rope Snatch, 50%  
Lane's Patent Automatic Lock and Junior.....30%  
Stowell's Novelty, Mal. Iron.....50%  
Stowell's Loding, 80%.....50½10%  
See also Machines, Hoisting.

## Boards, Stove—

Zinc, Crystal, &c.....40%  
Paper Embossed.....40½10%

## Boards, Wash—

See Washboards.

## Bobs, Plumb—

Keuffel & Esser Co.....35½45%

## Boils—

Carriage, Machine, &c.—  
Common Carriage (cut thread):  
% X 6 and smaller 70½12½6%  
Larger and Longer 60½2½6%  
Phila. Eagle \$3.00 list May 21, '99

Bolt Ends.....65@65½5%  
Machine, % 2 4 and smaller.....70½12½6%  
Machine, larger and longer.....60½7½6%

## Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knch:  
Inch.....3 4 5 6 8  
Per doz.....\$1.30 .35 .45 .60 .80

Cast Iron Spring Foot, Jap'd:  
Inch.....6 8 10  
Per doz.....\$1.20 1.50 2.25

Cast Iron Chain, Flat, Japanned:  
Inch.....6 8 10  
Per doz.....\$1.00 1.40 1.85

Cast Iron Flat Shutter, Jap'd., Brass Knobs:  
Inch.....6 8 10  
Per doz.....\$0.75 .25 1.25

Wrought Barrel Jap'd.....80@80½10%  
Barrel Bronzed.....60½10%  
Spring.....70½10@70½10½5%  
Shutter.....50½10@50½10½5%  
Square Neck.....70½10@70%  
Ives' Patent Door.....50%

## Plow and Stove—

Plow.....65½10@—%  
Stove.....85½10%

## Tire—

Common Iron.....80%  
Norway Iron.....80%  
American Screw Company:  
Norway Phila., list Oct. 16, '94.....80%  
Eagle Phila., list Oct. 16, '94.....82½%  
Hay State, list Dec. 28, '99.....80%  
Franklin Moore Co.:  
Norway Phila., list Oct. 16, '94.....80%  
Eagle Phila., list Oct. 16, '94.....82½%  
Eclipse, list Dec. 28, '99.....80%  
Mount Carmel Bolt Co.:  
Norway Phila., list Oct. 16, '94.....80%  
Eagle Phila., list Oct. 16, '94.....82½%  
Mount Carmel, list Dec. 28, '99.....80%  
Russell, Burdall & Ward Bolt & Nut Co.:  
Empire, list Dec. 28, '99.....80%  
Norway Phila., list Oct., '94.....80%  
Unson Nut Co.:  
Tire Bolts.....72½4%

## Borers, Tap—

Borers Tap, Ring, with Handle:  
Inch.....1¼ 1½ 1¾ 2  
Per doz.....\$4.80 5.60 6.40 8.00

Inch.....2¼ 2½ 2¾ 3  
Per doz.....\$5.65 6.15 6.65 7.15

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.50 each.....25%

## Boxes, Mitre—

C. E. Jennings & Co.....30%  
Langdon, New Langdon and Langdon Improved, 20½10%; Langdon Acme.....15½10%  
Perfection.....40%  
Sealey.....40%  
Stanley R. & L. Co.; Nos. 210 to 460, 30%; Nos. 50 and 60.....35%

## Braces—

Common Ball, American, \$1.25@1.50  
Barber's.....50½10@60½10%  
Fray's Genuine Spofford's.....60%  
Fray's No. 70 to 120, 81 to 123, 207 to 311.....60%  
C. E. Jennings & Co.....50½10%  
Mayhew's Ratchet.....50%  
Mayhew's Quick Action Hay Pat.....50%  
Millers Falls Drill Braces.....25½10%  
P. S. & W. Co., Peck's Pat. 60@60½5%  
Stanley R. & L. Co.:  
Stanley, 35%; Victor.....45%

## Brackets—

Wrought Steel.....80@80½5%  
Griffin's Pressed Steel.....75½10@80%  
Griffin's Folding Brackets.....70½10%  
Stowell's Cast Shelf, 75%; Sink.....50%  
Western W. G. Co. Wire.....80½10%

## Bright Wire Goods—

See Wire and Wire Goods.

## Boilers—

Kilbourne Mfg. Co.....75½20%  
Western W. G. Co.....80%  
Wire Goods Co.....75@75½10%

## Buckets, Galvanized—

M'f'r's list, price per gross:  
Quart. 10 12 14  
Water, Reg.....25.35 28.00 32.00  
Water, H.W.....32.00 35.00 38.00  
Fire, Rd. Btm. 32.00 34.65 38.65  
Well.....37.35 41.35 45.35

## Bucks, Saw—

Hoosier..... $\frac{1}{2}$  gro. \$36.00

## Bull Rings—See Rings, Bull

## Butts—Brass—

Wrought, High List, Oct. 26, '06.

## Cast Iron—

Fast Joint, Broad.....40½17@50%  
Fast Joint, Narrow.....40½10@50%  
Loose Joint.....70½10@75%  
Loose Pin.....70½10@75%  
Mayer's Hinges.....70½70½5%  
Parliament Butts.....70@70½5%

## Wrought Steel—

Reversible and Broad, 75%  
Light Reversible, Light  
Narrow.....75%  
Loose Joint Narrow 1½  
Inside Blind, etc. 70½10%  
Bark Flaps, Table.....70%  
Chest.....70%  
Extra.....100½10%

## Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, 10%; 1200, 25%; 200, 300, 600, 30%  
Hendryx Bronze: Series 700, 800, 40%  
Hendryx Enameled.....40%



**Calipers—See Compasses.****Calks, Toe and Heel—**

Blunt, 1 prong..... per lb. 1.45  
 Sharp, 1 prong..... per lb. 1.45  
 Burke's Blunt, 4 prong; Sharp, 4 prong  
 Gautier, Blunt, 4 prong; Sharp, 4 prong  
 Perkins, Blunt, 4 prong; Sharp, 4 prong

**Can Openers—**

See Openers, Can.

**Cans, Milk—**

Illinois Pattern..... 1.35 1.85 2.10 each.  
 New York Pattern..... 1.50 2.20 2.45 each.  
 Baltimore Pattern..... 1.50 2.20 2.45 each.  
 Dubuque..... 1.35 1.60 1.75 each.

**Cans, Oil—**

Bullado Family Oil Cans:  
 5 10 gal. 18.00 60.00 120.00 gro., net.

**Caps, Percussion—**

Eley's E. B. .... 50¢ 55¢  
 G. D. .... per M 34¢ 35¢  
 F. L. .... per M 40¢ 42¢  
 G. E. .... per M 48¢ 50¢  
 Musket .... per M 68¢ 69¢

**Primers—**

Berdan Primers, 2¢ per M. 20¢ 5¢  
 Primer Shells and Bullets, 15¢ 10¢  
 All other primers per M \$1.50 @ 1.60

**Cartridges—**

Blank Cartridges:  
 32 C. F., \$5.50..... 10¢ 5¢  
 38 C. F., \$7.00..... 10¢ 5¢  
 22 cal. Rim, \$1.50..... 10¢ 5¢  
 32 cal. Rim, \$2.75..... 10¢ 5¢  
 B. B. Caps, Con. Ball, Sigd., \$1.50  
 B. B. Caps, Round Ball..... \$1.49  
 Central Fire..... 25¢  
 Target and Sporting Rifle..... 15¢ 5¢  
 Prized Shells and Bullets, 15¢ 10¢  
 Rim Fire, Sporting..... 50¢  
 Rim Fire, Military..... 15¢ 5¢

**Castors—**

Bed ..... 70¢ 70¢ 10¢  
 Plate ..... 60¢ 10¢ 60¢ 10¢ 5¢  
 Philadelphia ..... 75¢ 75¢ 10¢  
 Acme, Ball Bearing..... 35¢ 10¢  
 Boss ..... 70¢ 10¢  
 Boss Anti-Friction..... 70¢ 10¢  
 Gem (Roller Bearing)..... 30¢  
 Martin's Patent (Phoenix)..... 45¢  
 Standard Ball Bearing..... 30¢  
 Tucker's Patent, low list..... 30¢  
 Yale (Double Wheel) low list..... 50¢

**Cattle Leaders—**

See Leaders, Cattle.

**Chain, Coil—**

American Coil, Straight Link:  
 5-16 1/4 5-16 3/8 7-16 1/2 9-16  
 \$9.15 6.30 5.55 4.55 4.35 4.10  
 7/8 3/4 1 to 1-1/8 1 1/2 to 1 3/4 inch.  
 \$4.00 3.50 3.85 3.95  
 German Coil..... 60¢ 10¢ 60¢ 10¢ 70¢

**Halter—**

Halter Chains..... 60¢ 60¢ 5¢  
 Human Pattern Halter Chains,  
 list July 24, '97..... 60¢ 10¢ 5¢  
 Covert Mfg. Co. .... 35¢ 5¢

**Cow Ties—**

See Halters and Ties.

**Trace, Wagon, &c.—**

Traces, Western Standard: 100 pr.  
 6 1/2-6-3, Straight, with ring, \$27.00  
 6 1/2-6-2, Straight, with ring, \$28.00  
 6 1/2-8-2, Straight, with ring, \$32.00  
 6 1/2-10-2, Straight, with ring, \$37.00

NOTE—Add 2¢ per pair for Hooks.  
 Twist Traces: add per pair for Nos. 2  
 and 3, 2¢; No. 1, 3¢; No. 4, 4¢ to price of  
 Straight Link.  
 Eastern Standard Traces, Wag-  
 on Chain, &c..... 60¢ 5¢

**Miscellaneous—**

Jack Chain, list July 10, '93:  
 Iron ..... 60¢ 10¢  
 Brass ..... 60¢ 5¢  
 Safety and Plumbers' Chain, 70¢  
 6 1/2-ump Chain..... 10¢ 4 1/2¢  
 Covert Mfg. Co.:  
 Breast, Halter, Heel, Rein, Stal-  
 lion..... 40¢  
 Oneida Community:  
 Am. Dog Leads and Kennel Chains,  
 40 to 105 5¢  
 Niagara Dog Leads and Kennel  
 Chains..... 45¢ 50¢ 5¢  
 Wire Goods Co.:  
 Dog Chain..... 70¢ 10¢  
 Universal Dbl. Jointed Chain..... 50¢

**Chain and Ribbon, Sash—**

Oneida Community:  
 Copper Chain, 60¢ 5¢; Steel Chain,  
 60¢  
 Pullman:  
 Bronze Chain, 60¢; Steel Chain,  
 60¢ 10¢  
 Sash Chain Attachments, per set, 8¢  
 Aluminum Sash Ribbon, per 100  
 ft..... \$1.25 @ \$3.00  
 Sash Ribbon Attachments, per set, 8¢

**Chalk—**

(From Jobbers.)  
 Carpenters' Blue..... gro., 50¢ 55¢  
 Carpenters' Red..... gro., 45¢ 50¢  
 Carpenters' White..... gro., 40¢ 45¢

**Checks, Door—**

Bardsley's..... 45¢  
 Pullman, per gro..... 85¢ 10¢  
 Russell..... 35¢ 4¢

**Chests, Tool—**

American Tool Chest Co.:  
 Boys' Chests, with Tools..... 55¢  
 Youth's Chests, with Tools..... 40¢  
 Gentlemen's Chests, with Tools, 30¢  
 Farmers' Carpenters' etc. Chests,  
 with Tools..... 20¢

Machinists' and Pipe Fitters'  
 Chests, Empty..... 30¢  
 Tool Cabinets..... 50¢  
 C. E. Jennings & Co.'s Machinists'  
 Tool Chests..... 35¢ 10¢

**Chisels—**

Socket Framing and Firmer  
 Standard List..... 75¢ 75¢ 5¢  
 Buck Bros..... 30¢  
 Charles Buck Edge Tool Co..... 30¢  
 C. E. Jennings & Co.:  
 Socket Firmer No. 10..... 60¢  
 Socket Framing No. 15..... 60¢  
 Swan's..... 75¢  
 L. & I. J. White Co..... 30¢ 30¢ 5¢

**Tanged—**

Tanged Firmers..... 40¢  
 Buck Bros..... 30¢  
 Charles Buck Edge Tool Co..... 30¢  
 C. E. Jennings & Co. Nos. 191, 181, 25¢  
 L. & I. J. White Co..... 25¢ 5¢

**Cold—**

Cold Chisels, good quality, 13¢ 15¢  
 Cold Chisels, fair quality, 11¢ 12¢  
 Cold Chisels, ordinary, 9¢ 10¢

**Chucks—**

Almond Drill Chucks..... 35¢  
 Almond Turret Six-Tool Chuck..... 40¢  
 Beach Pat., each \$6.00..... 35¢ 5¢  
 Empire..... 25¢  
 Blacksmiths'..... 25¢  
 Jacobs' Drill Chucks..... 25¢  
 Pratt's Positive Drive..... 25¢  
 Skinner Patent Chucks:  
 Independent Lathe Chucks..... 40¢  
 Universal, Reversible Jaws..... 40¢  
 Combination, Reversible Jaws..... 40¢  
 Drill Chucks, New Model, 25¢:  
 Standard, 40¢ 10¢; Skinner Pat.,  
 25¢; Positive Drive..... 40¢  
 Planer Chucks..... 30¢  
 Face Plate Jaws..... 40¢  
 Standard Tool Co.:  
 Improved Drill Chuck..... 45¢  
 Union Mfg. Co.:  
 Combination, Nos. 1, 2, 3, 4, 5, 6,  
 7, 8 and 17, 40¢; No. 21..... 35¢  
 Scroll Combination, Nos. 82 and  
 84..... 35¢  
 Geared Scroll, Nos. 33, 34 and 35, 30¢  
 Independent Iron, Nos. 18 and 318, 35¢  
 Independent Steel, No. 61..... 25¢  
 Union Drill, Nos. 000, 00, 100, 101,  
 102, 103, 104..... 35¢  
 Union Car Drill..... 25¢  
 Universal 11, 12, 16, 17, 13, 14, 15, 35¢  
 Universal, No. 42..... 30¢  
 Iron Face Plate Jaws, Nos. 26, 30,  
 48 and 50..... 35¢  
 Steel Face Plate Jaws, Nos. 70 and  
 72..... 30¢  
 Westcott Patent Chucks:  
 Lathe Chucks..... 50¢  
 Little Giant Auxiliary Drill..... 50¢  
 Little Giant Double Grip Drill..... 50¢  
 Little Giant Drill, Improved..... 50¢  
 Oneida Drill..... 50¢  
 Scroll Combination Lathe..... 50¢

**Clamps—**

Adjustable, Hammers..... 20¢ 20¢ 5¢  
 Carriage Makers', P. S. & W.  
 Co..... 40¢ 10¢ 50¢  
 Reily, Parallel..... 35¢ 10¢  
 Lineman's, Utility Drop Forge & Tool  
 Co..... 40¢  
 Wood Workers, Hammers..... 40¢ 10¢  
 Saw Clamps, see Vices, Saw Filers'

**Cleaners, Drain—**

Iwan's Champion, Adjustable..... 55¢  
 Iwan's Champion, Stationary..... 45¢

**Sidewalk—**

Star Socket, All Steel, 30 doz. \$4.05 net  
 Star Shank, All Steel, 30 doz. \$3.24 net  
 W. & C. Shank, All Steel, 30 doz.,  
 7 1/2 in., \$3.00; 8 in., \$3.25

**Cleavers, Butchers'—**

Foster Bros..... 30¢  
 Fayette R. Plumb..... 30¢  
 L. & I. J. White Co..... 30¢

**Clippers, Horse and****Sheep—**

Chicago Flexible Shaft Company:  
 1902 Chicago Horse, each, \$10.75  
 20th Century Horse, each, \$5.00  
 Lightning Belt Horse, each, \$15.50  
 Chicago Belt Horse, each, \$20.00  
 Stewart's Enclosed Gear  
 Horse, each..... \$8.75  
 Stewart's Patent Sheep Shear-  
 ing Machine, each..... \$12.75  
 Stewart Enclosed Gear Shear-  
 ing Machine, No. 8, each, \$9.75

**Clips, Axle—**

Regular Styles, list July 1, '05, 80¢

**Cloth and Netting, Wire**

—See Wire, &c.

**Cocks, Brass—**

Hardware list:  
 Plain Bibbs, Globe, Kerosene,  
 Racking, Liquor, Bottling,  
 &c..... 70¢  
 Compression Bibbs..... 65¢ 10¢

**Coffee Mills—**

See Mills, Coffee.

**Collars, Dog—**

Nickel Chain, Walter B. Stevens &  
 Son's list..... 40¢  
 Leather, Walter B. Stevens & Son's  
 list..... 40¢

**Combs, Curry—**

Metal Stamping Co..... 40¢

**Compasses, Dividers, &c.**

Ordinary Goods..... 70¢ 10¢ 75¢  
 Wm. Schollhorn Co.:  
 Excelsior Dividers..... 55¢  
 Lodi Dividers..... 75¢

**Conductor Pipe—**

L. C. L. to Dealers:

Galv.	Charcoal	Copper.
Steel.	Iron.	14, 16 & 20 oz.
Eastern:	60%	30¢ 10%
Central:	65¢ 12 1/2%	30¢ 7 1/2%
Western and Southern:	65¢ 7 1/2%	55%
So. Western:	62 1/2%	50¢ 2 1/2%
Galvanized, ea. \$1.85	\$2.00	\$2.25
Galvanized, Lined, side handles,		
Gal..... 2	3	4
Each..... \$1.95	\$2.15	\$2.30
White Enamel, 25%; Agate Lined, 25%		

Terms, 60 days; 2¢ cash 10 days. Fac-  
 tory shipments generally delivered.

See also Eave Troughs.

**Coolers, Water—**

Gal, each, 2 3 4 6 8  
 Labrador..... \$1.20 \$1.50 \$1.80 \$2.10 \$2.70  
 Iceland, ea. \$1.80 \$2.10 \$2.40 \$3.00  
 Gal..... 2 3 4 6 8  
 Galvanized, ea. \$1.85 \$2.00 \$2.25 \$2.50 \$3.00  
 Galvanized, Lined, side handles,  
 Gal..... 2 3 4 6 8  
 Each..... \$1.95 \$2.15 \$2.40 \$3.00 \$1.15  
 White Enamel, 25%; Agate Lined, 25%

**Coopers' Tools—**

See Tools, Coopers'.

**Coppers' Soldering—**

Soldering Coppers, 3 lbs. to pair  
 and heavier, 30¢ 31¢; lighter  
 than 3 lb. to pair..... 32¢ 33¢

**Cord— Sash—**

Braided, Drab..... 10¢ 35¢  
 Braided, White, Cotton, Nos. 8  
 to 12, 25¢; No. 7, 25¢ 1/4; No. 6,  
 25¢  
 Cable Laid Italian, lb., No. 18, 36¢  
 Italian, lb., A. No. 18, 25¢; B. 21¢  
 Common India..... lb. 10¢ 10¢ 1/2  
 Cotton Sash Cord, Twisted, 17¢ 18¢  
 Patent Russia..... lb. 19¢  
 Cable Laid Russia..... lb. 20¢  
 India Hemp, Br'd'd..... lb. 20¢  
 India Hemp, Twisted, lb. 19¢ 18¢  
 Patent India, Twisted, lb. 16¢  
 Anniston Cordage Co.: 30 lb. solid  
 Braided, Nos. 8 to 12, \$0.24; No. 7,  
 \$0.21 1/4; No. 6, \$0.25; 30 doz., 50 ft.  
 Oriole, \$2.00; 50 ft., Columbia, \$0.85;  
 50 ft., Victoria, \$1.00; 50 ft., 6-Thread,  
 \$1.10; 60 ft., 3-Thread, \$0.95; 50 ft.,  
 Manila, \$1.90; 60 ft., Jute, \$0.75.  
 Pearl Braided, cotton, No. 6, 30 lb.,  
 25¢ 1/4; No. 7, 25¢; Nos. 8 to 12, 24¢ 1/4  
 Eddydate Braided, Nos. 8 to 10,  
 25¢; 7, 25¢ 1/4; 6, 26¢ 1/4  
 Harmony Cable Laid Italian, Nos. 7  
 to 12, 25¢ 1/4; No. 6, 26¢ 1/4  
 Pullman:  
 Wire Sash Cord..... 10¢  
 Sash Cord Attachments, per doz. 10¢  
 Samson, Nos. 8 to 12:  
 Braided, 30 lb., Drab Cotton,  
 55¢; Italian Hemp, 40¢ 45¢  
 55¢; Linen, 55¢; White Cot-  
 ton, 50¢; Spot Cord..... 50¢  
 Massachusetts, White..... 30 lb 45¢  
 Massachusetts, Drab..... 30 lb 45¢  
 No. 7, 28¢; No. 8, 30¢  
 Phoenix, White, Nos. 8 to 12, 27¢;  
 Silver Lake, per lb.:  
 A. Drab, 45¢; A. White, 40¢;  
 B. Drab, 40¢; B. White, 35¢;  
 Italian Hemp, 40¢; Linen..... 57¢ 1/4  
 See also Chain and Ribbon.

**Wire, Picture—**

List July 19, 1906..... 85¢ 10¢ 10¢  
 Hendryx Standard Wire Picture Cord,  
 old list, 85¢ 10¢

**Cradles—**

Grain..... 40¢ 12 1/2%

**Crayons—**

White Round Crayons, Cases, 100  
 gro., \$6.50 @ \$7.50 at factory, but  
 lower prices made by jobbers  
 Zelnicker's Lumber..... 30¢  
 White and Purple, Indelible..... 37¢ 50¢  
 Blue, Red, Green, Yellow and  
 Terra Cotta, \$5.50; Black..... \$4.00  
 Gemine Soapstone, Metal Workers',  
 5 in. x 3/4 in. Round, \$2.50; 5 in. x  
 3/4 in. Square, \$1.75; 5 x 3/4 x 3-16,  
 \$2.50; 5 x 1 1/4 x 3-16..... \$3.00

**Crooks, Shepherds'—**

Fort Madison, per doz., Heavy, \$7.00;  
 Light..... \$6.50

**Crow Bars—See Bars, Croc.****Cultivators—**

Victor Garden..... 50¢

**Cutlery, Table—**

International Silver Company:  
 No. 12 M'd'm Knives, 1817, 30 doz. \$3.50  
 Star, Eagle, Rogers & Hamilton  
 and Anchor..... 30 doz. \$3.00  
 Wm. Rogers & Son..... 30 doz. \$2.50

**Cutters— Glass—**

H. H. Mayhew Co..... 40¢  
 Red Devil..... 50¢  
 Smith & Hemenway Co..... 50¢  
 Woodward..... 50¢

**Meat and Food—**

American..... 30¢  
 Nos. .... 401 402 403 404 405 406 407  
 Each..... \$5 \$7 \$10 \$12 \$25 \$50 \$60  
 Enterprise:  
 Nos. .... 5 10 12 22 32  
 Each..... \$2 \$3 \$5 \$10 \$15 \$25 \$50 \$75 \$100  
 No. 202..... \$10 \$15 \$20 \$25 \$30 \$35 \$40 \$45 \$50  
 Dixon's..... 30 doz. 30¢ 30¢ 5¢  
 Nos. .... 1 2 3 4  
 Ideal..... \$14.00 \$17.00 \$19.00 \$20.00  
 Little Giant..... 30 doz. 40¢ 50¢  
 Nos. .... 305 310 315 320 325  
 \$35.00 \$48.00 \$44.00 \$72.00 \$68.00  
 N. E. Food Choppers..... 25¢  
 New Triumph No. 605, 30 doz. \$24.00  
 \$20.00  
 Ruswin Food, No. 1, \$24.00; No. 2,  
 \$27.00  
 Woodruff's..... 30 doz. 30¢ 30¢ 5¢  
 Nos. .... 100 150  
 Enterprise Beef Shavers..... 25¢ 30¢

**Slaw and Kraut—**

Henry Diston & Sons:  
 Slaw and Kraut Cutters, Corn  
 Graters, &c..... 35¢  
 J. M. Mast Mfg. Co.:  
 Slaw Cutters, 1 Knife..... 30 doz. \$3.00  
 Combined Slaw Cutter and Corn  
 Grater..... 30 doz. \$4.00  
 Tucker & Dorsey Mfg. Co.:  
 Kraut Cutters..... 40¢  
 Slaw Cutters, 1 Knife..... 30 gr. \$18¢ 20¢  
 Slaw Cutters, 2 Knife..... 30 gr. \$22¢ 33¢

**Tobacco—**

All Iron, Cheap, doz. \$4.25 @ \$4.50  
 Enterprise..... 25¢ 30¢  
 National, 30 doz., No. 1, \$21; No. 2,  
 \$18..... 40¢

**Diggers, Post Hole, &c.—**

Diston's:  
 Rapid, 30 doz., \$24.00..... 25¢  
 Samson, 30 doz., \$34.00..... 25¢  
 Iwan's Imp'd Post Hole Auger..... 30¢  
 Vaughan Pattern Post Hole Augers,  
 30 doz., \$6.25  
 Perfection Post Hole Diggers, 30  
 doz., \$8.75  
 Split Handle Post Hole Diggers,  
 30 doz., \$7.75  
 Kohler's, 30 doz., Universal, \$14.00;  
 Little Giant, \$12.00; Hercules,  
 \$10.00; Invincible, \$9.00; Rival,  
 \$8.00; Pioneer..... \$7.00  
 Never-Break Post Hole Diggers, 30  
 doz., \$24.00..... 60¢

**Dividers—See Compasses.****Drawers, Money—**

Tucker's Pat. Alarm Till No. 1, 30  
 doz., \$18; No. 2, \$15; No. 3, \$12;  
 No. 4, \$10

**Drawing Knives—**

See Knives, Drawing.

**Dressers, Emery Wheel—**

Sterling Emery Wheel Dressers..... 35¢  
 Sterling Wheel Dresser Cutters..... 35¢

**Drills and Drill Stocks—**

Blacksmiths' Common Drilling  
 Machines..... \$1.50 @ \$1.75  
 Breast, Millers Falls..... 10¢ 10¢  
 Breast, P. S. & W..... 40¢  
 Goodell Automatic Drills, 50¢ 10¢ 60¢ 10¢  
 Johnson's Automatic Drills, Nos. 2  
 and 3..... 16¢  
 Johnson's Drill Points..... 16¢  
 Millers Falls Automatic Drills, \$1.50 @ 1.75  
 Hatchet, Curtis & Curtis..... 25¢  
 Hatchet, Parker's..... 40¢  
 Hatchet, Weston's..... 40¢  
 Hatchet, Weston's, Style H Im-  
 proved..... 40¢  
 Hatchet, No. 112..... 40¢  
 Hatchet, Celebrated..... 40¢  
 Hatchet, Whitney's, P. S. & W. 50¢  
 Whitney's Hand Drill, No. 1, \$10.00;  
 Adjustable, No. 10, \$12.00..... 35¢ 4¢

**Twist Drills—**

Bit Stock..... 60¢ 10¢ 60¢ 10¢ 70¢  
 Taper and Straight Shank..... 60¢ 10¢ 60¢ 10¢ 5¢

**Drivers, Screw—**

Screw Driver Bits, per doz. 45¢ 50¢  
 Balsey's Screw Holder and Driver,  
 2 1/2-in., \$6; 4-in., \$7.50; 6-in.,  
 \$9  
 Buck Bros' Screw Driver Bits..... 50¢  
 Champion..... 50¢  
 Diston's..... 70¢  
 Edson..... 60¢  
 Fray's Hol. H'die Sets, No. 3, \$12.50;  
 Ford's Brass Screw Drivers..... 40¢ 10¢  
 Gray's Double Action Ratchet..... 35¢  
 Goodell's Auto..... 55¢ 55¢ 10¢  
 Mayhew's Black Handle..... 40¢  
 Mayhew's Monarch..... 40¢  
 Millers Falls, Nos. 20 and 21..... 25¢ 10¢  
 Millers Falls, Nos. 11, 12, 41, 42, 15¢ 10¢  
 New England Specialty Co..... 30¢  
 Smith & Hemenway Co., Never-  
 turn, 40¢ 45¢; Elmora..... 40¢  
 H. D. Smith & Co.'s Perfect H'die, 40¢  
 Stanley R. & L. Co.'s:  
 No. 64, Varn. Handles, 60¢ 10¢; No.  
 65, 70¢; Deffiance, 70¢; Hurwood,  
 55¢  
 Swan's:  
 Nos. 7565 to 7568, 50¢; No. 7540,  
 40¢ 10¢

**Eave Trough, Galvanized—**

Territory. L

**Extractors, Lemon Juice**

—See Squeezers, Lemon.  
**Fasteners, Blind—**  
 Zimmerman's ..... 50¢10%  
 Walling's ..... 40¢10%

**Cord and Weight—**

Ives ..... 33%

**Faucets—**

Cork Lined ..... 50¢10%  
 Metallic Key, Leather Lined ..... 60¢10%  
 Red Cedar ..... 40¢10%  
 Petroleum ..... 70¢10%  
 B. & L. B. Co.:  
 Metal Key ..... 60¢10%  
 Star ..... 60¢  
 West Lock ..... 50¢10%  
 John Sommer's Peerless Tin Key ..... 40¢  
 John Sommer's Boss Tin Key ..... 50¢  
 John Sommer's Victor Mill Key ..... 50¢10%  
 John Sommer's Duplex Metal Key ..... 40¢  
 John Sommer's Diamond Lock ..... 40¢  
 John Sommer's I. X. L. Cork Lined ..... 50¢  
 John Sommer's Reliable Cork Lined ..... 50¢10%  
 John Sommer's Chicago Cork Lined ..... 50¢  
 John Sommer's O. K. Cork Lined ..... 50¢  
 John Sommer's No Brand, Cedar ..... 40¢  
 John Sommer's Perfection, Cedar ..... 40¢  
 McKenna, Brass:  
 Burglar Proof, N. P. ..... 35¢  
 Improved, 1/4 and 1/2 inch ..... 35¢  
 Self Measuring ..... 40¢10%  
 Enterprise, 3/4 doz. \$36.00 ..... 40¢10%  
 Lane's, 1/2 doz. \$36.00 ..... 40¢10%  
 National Measuring, 1/2 doz. \$36.00 ..... 40¢10%

**Felloe Plates—**

See Plates, Felloe.

**Files—Domestic—**

List Nov. 1, 1899.

Best Brands ..... 70¢10%  
 Standard Brands ..... 75¢10%  
 Lower Grade ..... 75¢10%  
**Imported—**  
 Stubs' Tapers, Stubs' Hat, July 24, '97 ..... 33 1-3@40%

**Fixtures, Fire Door—**

Richards Mfg. Co.:  
 Universal, No. 103; Special, No. 104 ..... 35¢  
 Fusible Links, No. 96 ..... 50¢  
 Expansion Bolts, No. 107 ..... 60¢10%

**Grindstone—**

Net Prices:  
 15 17 19 21  
 Per doz. ..... \$3.25 3.75 4.25 4.75  
 P. S. & W. Co. ..... 30¢10%  
 Reading Hardware Co. ..... 30%  
 Stowell's Giant Grindstone Hanger ..... 40¢  
 Stowell's Grindstone Fixtures, Extra Heavy, 40¢10%; Light ..... 50%

**Fodder Squeezers—**

See Compressors.

**Forks—**

**NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.**  
 Iowa Dig-Easy Potato ..... 60¢10%  
 Victor, Hay ..... 50¢10%  
 Victor, Manure ..... 60¢  
 Victor, Header ..... 60¢  
 Champion, Hay ..... 60¢  
 Champion, Header ..... 60¢  
 Columbia, Hay ..... 60¢10%  
 Columbia, Manure ..... 70¢  
 Columbia, Spading ..... 70¢10%  
 Hawkeye Wood Barley ..... 40¢  
 W. & C. Potato Digger ..... 60¢10%  
 Acme Manure, 1 line ..... 60¢10%  
 Dakota Header ..... 60¢10%  
 Jackson Steel Barley ..... 60¢10%  
 Kansas Header ..... 60¢  
 W. & C. Favorite Wood Barley ..... 40¢  
 Plated.—See Spoons.

**Frames—Saw—**

White, 8'x7' Bar, per doz. 75¢10%  
 Red, 8'x7' Bar, per doz. \$1.00(1.25)  
 Red, 8'x7' Bar, per doz. \$1.40(1.50)

**Freezers, Ice Cream—**

Qt. .... 1 2 3 4 6  
 Each ..... \$1.30 \$1.60 \$1.90 \$2.20 \$2.50

**Fruit and Jelly Presses—**

See Presses, Fruit and Jelly.

**Fry Pans—See Pans, Fry.****Fuse—**

Per 1000 Feet.  
 Hemp ..... \$2.75  
 Cotton ..... 3.25  
 Waterproof Sgl. Taped ..... 3.60  
 Waterproof Dbl. Taped ..... 4.40  
 Waterproof Tpl. Taped ..... 4.15

**Gates, Molasses and Oil—**  
 Stebbins' Pattern ..... 80¢10%

**Gauges—**

Marking, Mortise, &c. 50¢10%  
 Chapin-Stephens Co.:  
 Marking, Mortise, &c. 50¢10%  
 Diston's Marking, Mortise, &c. 67%  
 Stanley R. & L. Co.'s Butt and Rabbit Gauge ..... 35%  
 Marking and Mortise ..... 50%  
 Wire, Brown & Sharpe's ..... 33%  
 Wire, Morse's ..... 25%  
 Wire, P. S. & W. Co. ..... 30%

**Gimlets—Single Cut—**

Numbered assortments, per gro.  
 Nail, Metal, No. 1, \$2.00; 2, \$2.30  
 Spike, Metal, No. 1, \$1.00; 2, \$1.30  
 Nail, Wood Handled, No. 1, \$2.30; 2, \$2.60  
 Spike, Wood Handled, No. 1, \$1.30; 2, \$1.60

**Glass, American Window**

See Trade Report.

**Glasses, Level—**

Chapin-Stephens Co. .... 60¢10%

**Glue, Liquid Fish—**

Bottles or Cans, with Brush ..... 25¢10%  
 International Glue Co. (Martin's) ..... 40%

**Grease, Axle—**

Common Grade ..... gro. \$1.50@6.00  
 Dixon's Everlasting, 10-lb pails, ea. \$6; in boxes, 1/2 doz., 1 lb. \$1.20;  
 2 lb. ..... \$2.00  
 Helmet Hard Oil ..... 25%

**Griddles, Soapstone—**

Pike Mfg. Co. .... 33%@33%10%

**Grindstones—**

Pike Mfg. Co.:  
 Improved Family Grindstones, 1/2 inch, 1/2 doz., \$2.00 ..... 33%  
 Royal Mfg. Co.:  
 Aluminum Grinding Machines, each, Nos. 01, \$1.75; 1A, \$2.50; 10, \$5.00 ..... 50%  
 Aluminum Sickle Grinders, each, Nos. 20A, \$6.00; 20A Combined, \$6.50 ..... 50%  
 Aluminum Disc Grinders, each, \$2.50 ..... 50%

**Grips, Nipple—**

Perfect Nipple Grips ..... 40¢10%2%

**Halters and Ties—**

Cow Ties ..... 60¢10%  
 Cover Mfg. Co.:  
 Web ..... 30¢10%  
 Jute Rope ..... 35¢  
 Sisal Rope ..... 20¢  
 Cotton Rope ..... 45¢  
 Hemp Rope ..... 45¢  
 Oneida Community:  
 Am. Coll and Halters ..... 40¢10%  
 Am. Cow Ties ..... 45¢10%  
 Niagara Coll and Halters ..... 45¢10%  
 Niagara Cow Ties ..... 45¢10%

**Hammers—****Handled Hammers—**

Heller's Machinists' ..... 55¢10%  
 Heller's Farmers' ..... 40¢10%  
 Magnetic Tack, Nos. 1, 2, 3, \$1.25, \$1.50, \$1.75 ..... 50%  
 Peck, Stow & Wilcox, Steel ..... 50%  
 Pavette R. Plumb:  
 Plumb, A. E. Nail ..... 40¢10%  
 Engineers' and B. S. Hand ..... 50¢10%  
 Machinists' Hammers ..... 50¢10%  
 Riveting and Tinner's ..... 40¢10%

**Heavy Hammers and Sledges—**

Under 3 lb., per lb., 50¢10%  
 3 to 5 lb., per lb., 40¢10%  
 Over 5 lb., per lb., 30¢  
 Wilkinson's Smiths' ..... lb. 9¢10%

**Handles—****Agricultural Tool Handles**

Arc. Pick, &c. .... 60¢10%  
 Hoe, Rake, &c. .... 40¢10%  
 Fork, Shovel, Spade, &c.:  
 Long Handles ..... 40¢10%  
 D Handles ..... 40%

**Cross-Cut Saw Handles—**

Atkins' ..... 40%  
 Champion ..... 50%  
 Diston's ..... 50%

**Mechanics' Tool Handles—**

Auger, assorted ..... gro. \$2.50@3.00  
 Brad Axl. .... gro. \$1.65@1.75  
 Chisel Handles, Ass'd, per gro.:  
 Tanged Firmer, Apple, \$2.10@2.25; Hickory ..... \$2.15@2.40  
 Socket Firming, Apple, \$1.75@1.95; Hickory ..... \$1.75@1.95  
 Socket Framing, Hickory ..... \$1.60@1.75  
 File, assorted ..... gro. \$1.30@1.40  
 Hammer, Hatchet, &c. .... 60¢10%

Hand Saw, Varnished, doz. 80¢10%; Not Varnished ..... 65¢10%  
 Plane Handles:  
 Jack, doz. 30¢; Jack, Bolted 75¢  
 Fore, doz. 45¢; Fore, Bolted 90¢  
 Chapin-Stephens Co.:  
 Carving Tool ..... 40¢10%  
 Chisel ..... 50¢10%  
 File and Awl ..... 60¢10%  
 Saw and Plane ..... 40¢10%  
 Screw Driver ..... 40¢10%  
 Millers Falls Adj. and Ratchet Auger Handles ..... 20¢10%  
 Nicholson Simplicity File Handle ..... 10¢10%

**Hangers—**

**NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.**  
 Allith Mfg. Co.:  
 Reliable, No. 1; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door ..... 50%  
 Chicago Spring Butt Co.:  
 Friction ..... 25%  
 Oscillating ..... 25%  
 Big Twin ..... 25%  
 Chisholm & Moore Mfg. Co.:  
 Baggage Car Door ..... 50%  
 Elevator ..... 30%  
 Railroad ..... 50%  
 Crank & Carrier Mfg. Co.:  
 Loose Axle ..... 60¢10%  
 Roller Bearing ..... 70%  
 Griffin Mfg. Co.:  
 Solid Axle, No. 10, \$12.00 ..... 70%  
 Roller Bearing, No. 11, \$15.00, 70%  
 Roller Bearing, Ex. Hy., No. 12, \$18.00 ..... 70%  
 Hinged Hangers ..... 60¢10%  
 Lane Bros. Co.:  
 Parlor, Ball Bearing, \$1.00; Standard, \$3.15; No. 105, \$2.85; New Model, \$2.85; New Champion ..... 25¢  
 Barn Door Standard ..... 60¢10%  
 Hinged ..... net \$6.08  
 Covered ..... 60¢10%  
 Special ..... 70¢10%  
 Lawrence Bros.:  
 Advance and Sterling ..... 60¢10%  
 Cleveland and Peerless ..... 70¢10%  
 Clipper, No. 75 ..... 60¢10%  
 Crown ..... 60¢10%  
 Cyclone-Tandem ..... net \$7.50  
 Easy Parlor Door, Dbl. Sets, \$2.50; Single Sets, \$1.25 ..... 60%  
 Giant ..... 60%  
 Hummer ..... 70¢10%  
 New Cyclone, Flexible, \$16.00 ..... 60%  
 New York ..... 60¢10%  
 McKinney Mfg. Co.:  
 No. 1, Special, \$1.45 ..... 60¢10%  
 No. 2, Standard, \$1.85 ..... 60¢10%  
 Hinged Hangers ..... 50%  
 Meyers Stoyon Hangers ..... 60¢10%  
 Richards Mfg. Co.:  
 Hangers, No. 47, 48, 147, 247, 304, 325 ..... 60¢10%  
 Pioneer Wood Track, No. 3, \$2.25; Roller B'r'g St'l Track No. 12, \$2.25; Roller B'r'g St'l Track No. 13, \$2.50; Roller B'r'g, No. 30, 41, 43, 75, 77, 79 ..... 75¢10%  
 Hero, Adj. Track No. 19, 50¢10%  
 Adjustable Track Tandem Trolly Track No. 16 ..... 50¢10%  
 Seal, Steel Track No. 8 ..... 35¢  
 Auto Adj. Track No. 22 ..... 50¢10%  
 Trolley B. D. No. 17, \$1.25; F. D. No. 120, \$2.25; No. 121, \$2.45; No. 150 ..... \$2.50  
 Safety Underwriters F. D. No. 12 ..... 50%  
 Tandem No. 41, 3 1/2 and 3 3/4 ..... 60¢10%  
 Palace Adjustable Trac No. 132 ..... 60¢10%  
 Royal, Adjustable Track No. 122 ..... 50¢10%  
 Ives' Wood Track No. 1 ..... 35¢  
 Trolley B. D. No. 29 ..... 50¢10%  
 Trolley B. D. No. 24, \$1.30; No. 27, \$1.40; No. 28 ..... \$1.60  
 Trolley B. D. No. 37, 38, 41, 43, 44, Sizes 1 and 2, 70¢10%  
 Anti-friction, No. 42; No. 44, sizes 2 1/2 and 3 ..... 60%  
 Hinged Tandem No. 46 ..... 60¢10%  
 Folding Door B. B. Swivel No. 12 ..... 40%  
 Stowell Mfg. & Foundry Co.:  
 Acme Parlor & Ball Bearing ..... 30%  
 Ajax Hinge Door ..... 60%  
 Apex Parlor Door ..... 50¢10%  
 Atlas ..... 60%  
 Baggage Car Door ..... 50%  
 Elevator Anti-Friction ..... 50%  
 Express ..... 50%  
 Lundy Parlor Door ..... 50%  
 Matchless ..... 60%  
 Nansen ..... 70%  
 Parlor Door, 50¢10%; Railroad, 50¢10%  
 Steel, No. 300, 404, 600 ..... 50%  
 Underwriters' Fire Door ..... 40%  
 Wild West Warehouse Door ..... 50%  
 Wilburn, No. 0, net, 1/2 doz. \$9.00; Zenith for Wood Track ..... 50%  
 A. L. Sweet Iron Works:  
 Check Back, 70%; Eagle ..... 70%  
 Clinker Anti-Friction ..... 50¢10%  
 Hyle Hinge, New Perfection, Pilot, Pilot Hinge ..... 60%  
 Rider Wooster ..... 65%  
 Western Pattern ..... 70%  
 Taylor & Hoggis P'y Co.'s Kidder's Roller Bearing, 50¢10%  
**Hangers—Garment—**  
 Pullman Trouser, 1 pair Flat Aluminum, \$9.00; 1 pair Round Nickelled, \$9.00; 4 pair Round Nickelled, \$27.00; 1 pair Flat Gun Metal, \$12.00; 1 pair Flat Black Enamelled, \$7.50; 1 pair Wood Clamp, \$13.50; Skirt Hangers, Folding, per gro. \$21.00; Coat Hangers, Folding, per gro. \$2.00; Garment Hanger Rods, Round Nickelled, per gro. \$10.50; Garment Hanger Loops, Round Nickelled, per gro. \$10.50  
 Victor Folding ..... 10¢10%  
 Western, W. G. Co. ..... 75¢10%

**Gate—**

Myers' Patent Gate Hangers, 1/2 doz. net ..... \$4.50

**Joist and Timber—**

Lane Bros. Co. .... 30%

**Hasps—**

Griffin's Security Hasp ..... 50¢10%  
 McKinney's Perfect Hasp, 1/2 doz. 50%

**Hatchets—**

Regular list, first quality ..... 50%  
 Second quality \$1.00 per doz. less than first quality.

**Heaters, Carriage—**

Clark, No. 5 1/2; No. 5R, \$2.00; No. 3 1/2; No. 3D, \$2.75; No. 1D, \$3.00; No. 1E, \$3.25; No. 1, \$3.50 ..... 25%  
 Clark Coal, 1/2 doz. 60¢10% ..... 30%

**Hinges—****Blind and Shutter Hinges—****Surface Gravity Locking Blind—**

(Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)  
 No. .... 1 3 5  
 Dos. pair ..... \$0.75 1.35 2.70

**Mortise Shutter—**

(L. & P. O. S., Dizie, &c.)  
 No. .... 1 1 1/2 2 1/2  
 Dos. pair ..... \$0.70 .65 .60 .55

**Mortise Reversible Shutter (Buffalo, &c.)**

No. .... 1 1 1/2 2  
 Dos. pair ..... \$0.70 .65 .60 .55

**North's Automatic Blind Fixtures**

No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50 ..... 10%  
 Charles Parker Co. .... 70¢10%  
 Parker Wire Goods Co.:  
 Hale & Benjamin Automatic Blind Hinges ..... 20%  
 Hale's Blind Awning Hinges, No. 110, for wood, \$9.00; No. 111, for brick, \$9.00 ..... 20%  
 Reading's Gravity ..... 60%  
 Stanley's Steel Gravity Blind Hinges, No. 167 1/2, 1/2 doz. sets, without screws, \$9.35; with screws, \$1.25, Wrightsville Hardware Co.:  
 O. S., Lull & Porter ..... 75¢10%  
 Acme, Lull & Porter ..... 75¢10%  
 Queen City Reversible ..... 75¢10%  
 Shepard's Noiseless, No. 60, 65, 68 ..... 75¢10%  
 Niagara Gravity Locking, No. 1, 3 & 5 ..... 75¢10%  
 1868, Old Pat'n, Nos. 1, 3 & 5 ..... 75¢10%  
 Tip Pat'n, Nos. 1, 3 & 5 ..... 75¢10%  
 Buffalo Gravity Locking, No. 1, 3 & 5 ..... 75¢10%  
 Shepard's Double Locking, Nos. 20 & 25 ..... 70%  
 Champion Gravity Locking, No. 75, 75 Steamboat Gravity Locking, No. 10, 75 Pioneer, Nos. 90, 45 & 9 1/2 ..... 75%  
 Empire, Nos. 101 & 103 ..... 70%  
 W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

**Gate Hinges—****Clark's or Shepard's—Doz. sets:**

No. .... 1 2 3  
 Hinges with Latches ..... 2.00 2.70 5.00  
 Hinges only ..... 1.40 3.05 3.80  
 Latches only ..... 70 70 33

**New England:**

With Latch ..... doz. .... \$2.00  
 Without Latch ..... doz. .... \$1.60

**Reversible Self-Closing:**

With Latch ..... doz. .... \$1.75  
 Without Latch ..... doz. .... \$1.35

**Western:**

With Latch ..... doz. \$1.75  
 Without Latch ..... doz. \$1.15

**Pivot Hinges**

Bommer Bros. Pivot ..... 40%  
 Lawson Mfg. Co. Matchless ..... 50%

**Spring Hinges—**

Holdback, Cast Iron ..... \$6.50@7.00  
 Non-Holdback, Cast Iron \$6.25@6.75

**J. Bardsley:**

Bardsley's Non-Checking Mortise Floor Hinges ..... 40%  
 Bardsley's Patent Checking ..... 33%  
 Bommer Bros.:  
 Bommer Ball Bearing Floor, 40%  
 Bommer Spring Hinges ..... 40%  
 No. 909 Wrot, Steel Hold Back, 1/2 gr. \$9.00

**Chicago Spring Butt Co.:**

Chicago Spring Hinges ..... 25%  
 Triple End Spring Hinges ..... 50%  
 Chicago (Ball Bearing) Floor ..... 50%  
 Garden City Engine House ..... 25%  
 Keene's Saloon Door ..... 25%  
 Columbian Hardware Co.:  
 Acme Wrought Steel ..... 30%  
 Acme Brass ..... 30%  
 American ..... 30%  
 Columbia, 1/2 gr., No. 14, \$9.00; No. 18, \$25.00  
 Columbia, Adj., No. 7, 1/2 gr. \$12.00  
 Columbian Hinges ..... 60¢10%  
 Gem, new list ..... 30%  
 Clover Leaf, new list ..... 1/2 gr. \$12.00  
 Oxford, new list ..... 30%  
 Floor Spring Hinges ..... 55¢10%  
 Lawson Mfg. Co. Matchless ..... 30%  
 Richards Mfg. Co.:  
 Superior Double Acting Floor Hinges ..... 40%  
 Shelby Spring Hinge Co.:  
 Buckeye All Steel Holdback Screen Door ..... 1/2 gr. \$9.00  
 Chief Ball Bearing Floor Hinge ..... 50%  
 Ball Bearing Door ..... 25%  
 No. 777, Sheet Steel Holdback, 1/2 gr. \$12.00  
 Superior Spring Hinge Co.:  
 Superior Floor Hinges ..... 33%  
 The Stover Mfg. Co.:  
 Ideal, No. 16, Detachable, 1/2 gr. \$12.50  
 Ideal, No. 4 ..... 1/2 gr. \$9.00  
 New Idea No. 1 ..... 30¢  
 New Idea, Double Acting ..... 50%  
 New Idea Floor ..... 50%

**Wrought Iron Hinges—****Strap and T Hinges, &c., list**

December 20, 1901:

Light Strap Hinges ..... 65%  
 Heavy Strap Hinges ..... 70%  
 Light T Hinges ..... 60%  
 Heavy T Hinges ..... 60%  
 Extra H'y T Hinges, 66 1/2%  
 Hinge Hasps ..... 15%  
 Cor. Heavy Strap ..... 70%  
 Cor. F. Heavy T ..... 66 1/2%  
 Screw Hook (6 to 12 in. lb. 3 1/2 and Strap. 1 1/2 to 20 in. lb. 3 1/2) (22 to 35 in. lb. 3 1/2)

Extra 10% often given on most of these Hinges.



**Screw Hook and Eye:**  
 1/2 to 1 inch.....lb. 6¢  
 1 1/2-inch.....lb. 7¢  
 2-inch.....lb. 8¢

**Hitchers, Stall—**  
 Covert Mfg. Co., Stall Hitchers.....30¢

**Hods—Coal—**  
 M'f'or's list, price per gross.  
 Inch.....15 16 17 18  
 Galv. Open.....\$35 \$39 \$42 \$46  
 Jap. Open.....26 28 31 35  
 Galv. Funnels.....43 48 52 56  
 Jap. Funnels.....33 36 39 43

**Masons' Etc.—**  
 Cleveland Wire Spring Co.:  
 Steel Brick, No. 162.....each \$1.05  
 Steel Mortar, No. 158.....each \$1.35

**Hoes—Eye—**  
 Secord and Oval Pattern.....60¢  
 Grub, list Feb. 25, 1899.....60¢  
 D. & H. Scovill.....70¢

**Handled—**  
 NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

**Cronk's Weeding, No. 1, 1904, \$2.50**  
**Star Double Bit.....\$3.20**  
**St. Madison Cotton Hoe.....\$3.20**  
**St. Madison Crescent Cultivator Hoe.....\$3.20**  
**St. Madison Mattock Hoe.....\$3.20**  
**Regular Weight.....\$3.20**  
**Junior Size.....\$3.20**  
**St. Madison Sprouting Hoe.....\$3.20**  
**St. Madison Dixie Tobacco Hoe.....\$3.20**  
**Kretzinger's Cut Easy.....\$3.20**  
**Warren Hoe.....\$3.20**  
**W. & C. Ivanhoe.....\$3.20**  
**B. B. 6 in. Cultivator Hoe.....\$3.20**  
**B. B. 6 in. Hoe.....\$3.20**  
**Acme Wedding.....\$3.20**  
**W. & C. L'ning Shuffie Hoe.....\$3.20**

**Hoisting Apparatus—**  
 See Machines, Hoisting.

**Holders—Bit—**  
 Angular, 1/2 doz.....45¢

**Door—**  
 Bardley's, Iron, 40%; Brass and Bronze.....35¢  
 Fullman.....35¢  
 Superior.....35¢

**File and Tool—**  
 Nicholson File Holders and File Handles.....35¢

**Fruit Jar—**  
 Triumph Fruit Jar Holder, 1/2 gross, \$10.80, 1/2 doz.....\$1.25

**Trace and Rein—**  
 Fernald Double Trace Holder, 1/2 doz. pairs.....\$1.25  
 Wash Rein Holder, 1/2 doz. pairs.....\$1.25

**Hones—Razor—**  
 Pike Mfg. Co., Belgian, German and Swat.....50¢

**Hooks—Cast Iron—**  
 Bird Case, Reading.....40¢  
 Clothes Line, Reading.....40¢  
 Clothes Line, Stowell.....40¢  
 Coat and Hat, Reading.....40¢  
 Coat and Hat, Stowell.....40¢  
 Coat and Hat, Wrightsville.....40¢  
 Harness, Reading.....40¢  
 Harness, Stowell.....40¢  
 School House, Stowell.....40¢

**Wire—**  
 Belt.....80¢  
 Wire C. & H. Hooks.....75¢  
 Columbian Hdw Co., Gen.....70¢  
 Parker Wire Goods Co., King.....70¢  
 Western W. G. Co., Molding.....75¢  
 Wire Goods Co.:  
 Acme, 60¢; Chief, 70¢; Crown, 75¢; Czar, 85¢; V Brace, 75¢; Czar Harness, 50¢

**Wrought Iron—**  
 Box, 6 in., per doz.....\$1.00; 8 in., \$1.25; 10 in., \$2.50.  
 Cotton.....doz. \$1.05 @ \$1.25  
 Wrought Staples, Hooks, &c.—See Wrought Goods

**Miscellaneous—**  
 Hooks, Bench, see Stops, Bench.  
 Bush, Light, doz. \$1.75; Medium, \$3.35; Heavy, \$6.25  
 Grass, best, all sizes, per doz.....\$1.30  
 Grass, common grades, all sizes, per doz.....\$1.30  
 Whitetree.....lb. 5¢ @ 6¢

**Hooks and Eyes:**  
 Brass.....60¢ @ 60¢ @ 10¢ @ 5¢  
 Malleable Iron.....70¢ @ 70¢ @ 10¢ @ 5¢  
 Covert Mfg. Co. Gate and Scuttle Hooks.....40¢  
 Ft. Madison Cut-Easy Corn Hooks.....40¢  
 Bench Hooks—See Bench Stops.  
 Corn Hooks—See Knives, Corn.

**Horse Nails—**  
 See Nails, Horse.

**Horseshoes—**  
 See Shoes, Horses.

**Hose, Rubber—**  
 Garden Hose, 1/2-inch:  
 Competition.....ft. 5 @ 6 @ 6 @ 6  
 3-ply Guaranteed.....ft. 8 @ 9 @ 9 @ 9  
 4-ply Guaranteed.....ft. 10 @ 11 @ 11 @ 11  
 Cotton Garden, 1/2-in., coupled:  
 Low Grade.....ft. 8 @ 9 @ 9 @ 9  
 Fair Quality.....ft. 10 @ 11 @ 11 @ 11

**Irons—Sad—**  
 From 1/2 to 10.....lb. 3 @ 3 1/4 @ 3 1/2 @ 3 3/4  
 R. B. Sad Irons.....lb. 5¢ @ 5 1/4 @ 5 1/2 @ 5 3/4  
 Mrs. Potts', cents per set:  
 Nos. 50 55 60 65  
 Jap'd Tops.....65 62 75 72

**Tin'd Tops.....70 67 80 77**  
**New England Pressing, lb. 5¢ @ 1¢**

**Pinking—**  
 Pinking Irons.....dos. 40¢

**Irons, Soldering**  
 See Copiers.

**Jacks, Wagon—**  
 Covert Mfg. Co.:  
 Auto Screw.....30¢ @ 2¢; Steel, 45¢  
 Lockport.....50¢  
 Lane's Steel.....30¢ @ 10¢ @ 2¢  
 Richards' Tiger Steel, No. 130.....50¢ @ 10¢  
 Smith & Hemenway Co.'s.....55¢

**Kettles—**  
 Brass, Spun, Plain.....20¢ @ 25¢  
 Kneaded and Cast Iron—See Ware, Hollow.

**Knives—**  
 Butcher, Kitchen, &c.—  
 Foster Bros. Butcher, &c.....30¢  
 Wilkinson Shear & Cutlery Co.....60¢

**Corn—**  
 Wilkinson Shear & Cutlery Co.:  
 Wilcut Brand Knives and Hooks.....60¢  
 Wilmington Acme.....1/2 doz. \$2.50  
 Dent, \$2.75; Add. Serrated, \$2.20;  
 Serrated, \$2.10; Yankee No. 1, \$1.50;  
 Yankee No. 2, \$1.15.

**Drawing—**  
 Standard List.....75¢ @ 75¢ @ 10¢  
 C. E. Jennings & Co., Nos. 45, 46, 60;  
 Jennings & Griffin, No. 41, 42.....75¢  
 Swan's.....70¢  
 Watrous.....16¢  
 L. & I. J. White.....20¢ @ 25¢

**Hay and Straw—**  
 Serrated Edge, per doz.....\$5.75 @ 6.00  
 Iwan's Sickle Edge.....1/2 doz. \$2.50  
 Iwan's Serrated.....1/2 doz. \$3.00

**Mincing—**  
 Buffalo.....1/2 doz. \$13.00

**Miscellaneous—**  
 Parriers.....1/2 doz. \$3.00 @ 3.25  
 Westenhelm's.....1/2 doz. \$3.00 @ 3.25

**Knobs—**  
 Base, 2 1/2-inch, Birch, or Maple,  
 Rubber Tip.....gro. \$1.25 @ \$1.40  
 Carriage, Jap., all sizes.....gro. 10¢ @ 15¢

**Door, Mineral.....doz. 65¢ @ 70¢**  
**Door, Por. Jap'd.....doz. 70¢ @ 75¢**  
**Door, Por. Nickel.....doz. \$2.05 @ 2.15**  
**Bardley's Wood Door, Shutters, &c.....15¢**

**Lacing, Leather—**  
 See Belting, Leather.

**Ladders, Store, &c.—**  
 Allith Mfg. Co., Reliable.....50¢  
 Lane's Store.....50¢  
 Myers' Noiseless Store Ladders.....50¢  
 Richards Mfg. Co.:  
 Improved Noiseless, No. 112.....50¢  
 Climax Shelf, No. 113.....50¢  
 Trolley, No. 109.....50¢

**Ladies, Melting—**  
 L. & G. Mfg. Co. (low list).....25¢  
 P. S. & W.....40¢ @ 10¢  
 Reading.....50¢

**Lanterns—Tubular—**  
 Regular Tubular, No. 0.....doz. \$4.25 @ 4.50  
 Lift Tubular, No. 0.....doz. \$4.75 @ 5.00  
 Hinge Tubular, No. 0.....doz. \$4.75 @ 5.00  
 Other Styles.....40¢ @ 40¢ @ 5¢

**Bull's Eye Police—**  
 No. 1, 2 1/2-inch.....\$2.75 @ 3.00  
 No. 2, 3-inch.....\$3.00 @ 3.25

**Lasts and Stands, Shoe—**  
 Stowell's Atlas, Malleable Iron.....50¢  
 Stowell's Badger, Cast Iron.....50¢

**Latches—Thumb—**  
 Roggin's Latches, with screw.....doz. 35¢ @ 40¢

**Door—**  
 Allith Mfg. Co., Automatic, No. 400, 1/2 doz.....\$4.00  
 Cronk & Carrier Mfg. Co., No. 101, 1/2 doz.....\$2.30  
 Haap and Staples.....50¢  
 Richards' Bull Dog, Heavy, No. 125.....50¢ @ 55¢  
 Richards' Trump, No. 127.....\$1.50  
 Stowell's Steel.....50¢

**Leaders, Cattle—**  
 Small.....doz. 50¢; large, 60¢  
 Covert Mfg. Co.:  
 Cotton, 45%; Hemp, 45%; Jute, 35%;  
 Sisal, 20%.

**Lifters, Transom—**  
 R. & E.....10%

**Lines—**  
 Wire Clothes, Nos. 18 19 20  
 100 feet.....\$2.25 2.00 1.75  
 75 feet.....\$1.75 1.50 1.10  
 Anniston Waterproof Clothes, 50 ft.,  
 1/2 doz. \$2.00; Gilt Edge, \$2.00; All  
 Line, \$2.00; Acme, \$1.00; Advance,  
 \$1.00; Empire, \$1.00; Advance,  
 \$1.00; Eclipse, \$1.00; Chicago,  
 \$1.00; Standard, \$1.00; Columbia,  
 \$1.00; Allison, \$1.00; Calhoun, \$1.00.  
 Samsom Cordage Works:  
 Solid Braided Chalk, Nos. 3 & 3.40%  
 Solid Braided Mason's.....30%  
 Silver Lake Braided Chalk, No. 8,  
 \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3,  
 \$7.50; No. 4, \$8.00; No. 5, \$8.50;  
 500 yds. Lines, Shade Cord, &c.:  
 White Cotton, No. 34, \$1.50; No. 4,  
 \$2.00; No. 4 1/2, \$2.50; Colors, No. 34,  
 \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75;  
 Lines, No. 34, \$2.50; No. 4, \$3.50;  
 No. 4 1/2, \$4.50.  
 Tent and Awning Lines: No. 5,  
 White Cotton, \$7.50; Drab Cotton,  
 \$8.50.  
 Clothes Lines, White Cotton: 50 ft.,  
 \$2.75; 60 ft., \$3.25; 70 ft., \$3.75;  
 80 ft., \$4.00; 90 ft., \$4.25; 100 ft.,  
 120 ft., \$5.25.

**Locks—Cabinet—**  
 Cabinet Locks.....33¢ @ 33 1/4¢ @ 7 1/4¢  
**Door Locks, Latches, &c.—**  
 NOTE.—Net prices are very often made on these goods.  
 Reading Hardware Co.....40%  
 R. & E. Mfg. Co.....10%

**Elevator—**  
 Stowell's.....50%

**Padlocks—**  
 R. & E. Mfg. Co. Wrought Steel and Brass.....75¢ @ 10%

**Sash, &c.—**  
 Ives' Patent:  
 Bronze and Brass, 60%; Crescent,  
 40¢ @ 20¢; Iron, 60%; Window Ventilating,  
 55%; Robinson Pat. Ventilating Sash Lock, 35%; Wrought  
 Bronze and Brass, 50%; Wrought Steel, 55%.

**Fullman Patent Ventilating Lock.....35%**  
**Reading.....40%**

**Machines—Boring—**  
 Com. Up'r't, without Augers.....\$2.00 @ 2.25  
 Com. Ang'r, without Augers.....\$2.25 @ 2.50

**Swan's Improved.....40¢ @ 10%**  
**Jennings' Nos. 1 and 4.....33 1/4¢**  
**Millers' Falls.....5 1/2¢**  
**Snell's, Upright, \$2.65; Angular, \$2.90**

**Corking—**  
 Reliance Invariable Hand Power.....1/2 doz. \$18.00

**Fence—**  
 Williams' Fence Machines.....each \$5.50

**Hoisting—**  
 Moore's Anti-Friction Chain Hoist.....30%  
 Moore's Hand Hoist, with Lock Brake.....20%  
 Moore's Cyclone High Speed Chain Hoist.....25%

**Ice Cutting—**  
 Chandler's.....12 1/4%

**Washing**  
 Ross Washing Machine Co.: Per doz.  
 Ross No. 1.....\$57.00  
 Ross Rotary.....\$57.00  
 Champion Rotary Banner No. 1.....\$57.00  
 Standard Champion No. 1.....\$57.00  
 Standard Perfection.....\$57.00  
 Cincinnati Square Western.....\$57.00  
 Uneda American, Round.....\$57.00

**Mallets—**  
 Hickory.....45¢ @ 50¢  
 Lignumvitae.....45¢ @ 50¢  
 Tinners' Hickory and Applewood.....doz. 45¢ @ 50¢

**Mangers, Stable—**  
 Sweet Iron Works.....50%

**Mashers, Vegetable—**  
 Western, W. G. Co., Potato.....60¢ @ 10%

**Mats, Door—**  
 Elastic Steel (W. G. Co.), new list.....50%  
 Keystone Wire Matting Co.:  
 Keystone.....50%  
 Ideal.....50%

**Mattocks—**  
 See Picks and Mattocks.

**Milk Cans—See Cans, Milk.**

**Mills, Coffee, &c.—**  
 Enterprise Mfg. Co.....20¢ @ 25%  
 National list Jan. 1, 1902.....30%  
 Parker's Columbia & Victoria, 50¢ @ 100¢  
 Parker's Box and Side.....50¢ @ 100¢  
 Swift, Lane Bros. Co.....30%

**Motors Water—**  
 Divine's Red Devil.....30%

**Mowers, Lawn—**  
 NOTE.—Net prices are generally quoted cheap.  
 All sizes, \$1.85 @ 2.00.  
 Cheap.....all sizes, \$2.00 @ 2.50  
 Better Grade.....all sizes, \$2.50 @ 4.50  
 12 14 16 18 in.

**High Grade.....\$4.50 4.75 5.00 5.25**  
**Continental.....60¢ @ 5¢**  
**Great American.....70¢**  
**Great American Ball B'g, new list.....70¢**  
**Quaker City.....70¢**  
**Pennsylvania.....60¢ @ 5¢**  
**Pennsylvania, Jr. Ball Bearing.....60¢**  
**Pennsylvania Golf.....33¢ @ 5¢**  
**Pennsylvania Pony.....40¢ @ 5¢**  
**Granite State:**  
 Style A, Low Wheel.....70¢ @ 10¢ @ 10%  
 Style B, Low Wheel.....70¢ @ 10%  
 Style C, High Wheel.....70¢ @ 10%  
 Style D, High Wheel.....70%  
 Philadelphia:  
 Styles M., S., C. K. T.....70¢ @ 10¢ @ 5%  
 Style A, All Steel.....60¢ @ 10¢ @ 5%  
 Style F, High Wheel.....70¢ @ 10¢ @ 5%  
 Drexel and Gold Coin, special list.....40%

**Nails—**  
 Wire Nails and Brads, Miscellaneous.....85¢ @ 10¢ @ 85¢ @ 10¢ @ 5%  
 Cut and Wire. See Trade Report.  
 Hungarian, Finishing, Upholsterers' &c. See Tacks.

**Horse—**  
 Nos. 4 7 8 9 10  
 Anchor.....23 21 20 19 18.....40¢ @ 5%  
 Champlain.....28 26 25 24 23.....50%  
 Coleman.....13 12 11 11 11.....net  
 New Haven.....23 21 20 19 18.....40¢ @ 5%  
 Livingston.....19 18 17 16 16.....10%  
 Western.....19 18 17 16 16.....10%  
 Jobbers' Special Brands.....per lb. 9¢ @ 10¢

**Picture—**  
 Nos. 15 24 3 10  
 Brass H'd's.....55 60 70.....gro  
 Por. Head.....1.10 1.10 1.10.....pro

**Nippers—**  
 See Pliers and Nippers.

**Nuts—**  
 Cold Punched: Off list.  
 Square, Blank or Tapped.....1.00  
 Hexagon, Blank or Tapped.....5 10¢  
 Square, B'V, C. T. & R.....5 10¢  
 Hexagon, B'V, C. T. & R.....5 10¢

**Hot Pressed:**  
 Square, Blank.....5.00¢  
 Hexagon, Blank.....5.4¢  
 Square, Tapped.....4.70¢  
 Hexagon, Tapped.....5.10¢

**Oakum—**  
 Rest.....lb. 6 1/4¢  
 U. S. Navy.....lb. 6¢  
 Navy.....lb. 5¢  
 Plumbers' Spun Oakum.....5¢  
 In carload lots 1/4¢ lb. off, f.o.b. New York.

**Oil Tanks—See Tanks, Oil.**

**Oilers—**  
 Brass and Copper.....50¢ @ 10%  
 Tin or Steel.....65¢ @ 10¢ @ 70%  
 Zinc.....65¢ @ 10¢ @ 70%  
 Chase or Paragon:  
 Brass and Copper.....50¢ @ 10%  
 Tin or Steel.....65¢ @ 10%  
 Zinc.....65¢ @ 10%  
 Malleable, Hammers Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.

**American Tube & Stamping Co.:  
 Spring Bottom Cans.....70¢ @ 70¢ @ 10%  
 Railroad Oilers, &c.....60¢ @ 60¢ @ 10%**

**Openers—Can—Per doz.**  
**Sprague, Iron Handle.....30¢ @ 35¢**  
**Sprague, Wood Handle.....35¢ @ 40¢**  
**Sardine Scissors.....\$1.75 @ \$3.00**  
**Vim Tin Shear and Can Opener.....\$7.50**  
**Yankee Can and Bottle Opener.....\$0.75**  
**doz., net.....\$0.75**

**Egg—**  
 Nickel Plate, 1/2 doz., \$2.00; Silver Plate, \$4.00.

**Packing—**  
 Asbestos Packing, Wick and Rope.....17¢ @ 22¢

**Rubber—**  
 (Fair quality goods.)  
 Sheet, C. I.....11¢ @ 12¢  
 Sheet, C. O. S.....11¢ @ 12¢  
 Sheet, C. B. S.....12¢ @ 13¢  
 Sheet, Pure Gum.....10¢ @ 15¢  
 Sheet, Red.....10¢ @ 15¢  
 Jenkins' '95, 1/2 lb. 80¢.....25%

**Miscellaneous—**  
 American Packing.....lb. 7¢ @ 10¢  
 Cotton Packing.....lb. 16¢ @ 25¢  
 Italian Packing.....lb. 9¢ @ 12¢  
 Jute.....lb. 4¢ @ 15¢  
 Russia Packing.....lb. 8¢ @ 11¢

**Pails, Creamery—**  
 R. M. Co., with gauges, 1/2 doz., No. 1, \$6.25; No. 2, \$6.50.

**Pails, Water, Well, &c.—**  
 See Buckets.

**Pans—Dripping—**  
 Standard List.....65¢ @ 7 1/4¢  
 Edwards, Royal Blue.....65¢ @ 7 1/4¢

**Fry—**  
 Common Lipped:  
 Nos. 1 2 3 4 5  
 Per doz. \$0.75 0.80 0.90 1.10 1.30

**Refrigerator, Galva—**  
 Inch.....12 14 16 18  
 Per doz.....\$1.75 2.25 2.80 3.15

**Roasting and Laking—**  
 Regal, B. M. Co., 1/2 doz., Nos. 3, \$4.50; 10, \$5.25; 20, \$5.75; 30, \$6.25.  
 Savory, 1/2 doz., net, No. 200, \$9.00; 400, \$15.00.  
 Simplex, 1/2 doz. No. 40 50 60 100 150 160  
 \$50.00 55.00 60.00 65.00 70.00 75.00

**Paper—Building Paper**  
 Roll Board or Building Felt,  
 6 to 30 lb., per 100 sq. ft. 3 1/2 @ 5¢  
 Roll Board or Building Felt,  
 3-32 and 1/4 in., 45 to 60 lb.,  
 per 100 sq. ft. 3 1/2 @ 5¢  
 Mill Board, Sheet, 40 & 40 in.,  
 1-32 to 1/2 in. 3 1/2 @ 5¢  
 Per roll.....65¢ @ 70¢

**Rosin Sized Sheathing: 500 sq. ft.**  
 Light weight, 25 lbs. to roll.....40¢ @ 50¢  
 Medium weight, 30 lbs. to roll.....50¢ @ 55¢  
 Heavy weight, 40 lbs. to roll.....65¢ @ 70¢

**Black Water Proof Sheathing,**  
 500 sq. ft., 1 ply, 65¢; 2 ply,  
 85¢; 3 ply, \$1.10; 4 ply, \$1.25.  
 Deafening Felt, 9, 6 and 1 1/2 sq. ft. to lb. ton.....\$50.00  
 Red Rope Roofing, 250 sq. ft. per roll.....\$1.75

**Tarred Paper—**  
 1 ply (roll 100 sq. ft.), ton.....\$31.00 @ 33¢.00  
 2 ply, roll 108 sq. ft. ton.....\$76¢  
 3 ply, roll 108 sq. ft. ton.....\$81¢  
 Slater's Felt (roll 500 sq. ft.), 76¢

**Sand and Emery—**  
 Flint Paper and Cloth.....50¢ @ 10¢  
 Garnet Paper and Cloth.....25%  
 Emery Paper and Cloth.....50¢ @ 10¢ @ 60%

**Papers—Apple—**  
 Advance.....1/2 doz. \$4.00  
 Baldwin.....1/2 doz. \$4.00  
 Bonanza Improved.....each \$6.00  
 Daisy.....1/2 doz. \$4.00  
 Dandy.....1/2 doz. \$4.00  
 Eureka Improved.....each \$7.50  
 Family Ray State.....1/2 doz. \$15.00  
 Improved Ray State.....1/2 doz. \$15.00  
 Little Star.....1/2 doz. \$15.00  
 New Lightning.....1/2 doz. \$15.00  
 Reading Star.....1/2 doz. \$15.00  
 Rocking Table.....1/2 doz. \$15.00  
 Sun Table.....1/2 doz. \$15.00  
 White Mountain.....1/2 doz. \$15.00

**Potato—**  
Saratoga..... $\frac{1}{2}$  doz. \$7.00  
White Mountain..... $\frac{1}{2}$  doz. \$6.00

**Picks and Mattocks—**  
List, Feb. 23, 1899.....70¢10¢75¢  
Cronk's Handled Garden Mattock,  
doz., No. 2, \$2.60; No. 3, \$6.40.

**Pinking Irons—**  
See Irons, Pinking.

**Pins, Escutcheon—**  
Brass.....50¢10¢60¢  
Iron, list Nov. 11, '85.....60¢60¢10¢

**Pipe, Cast Iron Soil—**  
Carload lots.  
Standard, 2-6 in. 50¢10¢50¢10¢5¢  
Extra Heavy, 2-6 in. ....55¢10¢  
Fittings.....70¢10¢70¢10¢5¢

**Pipe, Merchant—**  
Consumers, Carload.  
Steel..... $\frac{1}{2}$  doz. \$7.00  
Blk. Galv. Blk. Galv.  
 $\frac{1}{2}$  doz. \$7.00  
1/2 in. ....63 52 64.5 48.5  
3/4 in. ....70 56 61.5 56.5  
1 in. ....72 60 72.5 62.5  
1 1/4 in. ....76 66 72.5 62.5  
2 to 12 in. ....71 56 63 53

**Pipe, Vitrified Sewer—**  
Carload lots.  
Standard Pipe and Fittings, 3  
to 24 in., f.o.b. factory:  
First-class.....55¢86¢  
Second-class.....50¢90¢  
NOTE.—Market irregular.

**Pipe, Stove—**  
Per 100 joints.  
Edwards' Nested: C. L. L. C. L.  
5 in. Standard Blue.....62.5 7.25  
6 in. Standard Blue.....67.5 7.75  
7 in. Standard Blue.....72.5 8.25  
5 in. Royal Blue.....70 8.00  
6 in. Royal Blue.....75 8.50  
7 in. Royal Blue.....80 9.00

**Plan and Plane Irons—**  
Wood Planes—  
Bench, first qual.....30¢30¢10¢  
Bench, second qual.....40¢40¢10¢  
Molding.....25¢25¢10¢  
Bailey's (Stanley R. & L. Co.).....35¢35¢24¢  
Chapin-Stephens Co.:  
Bench, First Quality.....30%  
Bench, Second Quality.....40%  
Molding and Miscellaneous.....35%  
Toy and German.....30%  
Union.....60%

**Iron Planes—**  
Bailey's (Stanley R. & L. Co.).....35%  
Chapin-Stephens Co.:  
Miscellaneous Planes (Stanley R. & L. Co.).....30%  
Union.....60%

**Plane Irons—**  
Wood Bench Plane Irons, list  
Dec. 12, '06.....25%  
Buck Bros.....30%  
Chapin-Stephens Co.....35%  
Stanley R. & L. Co.....40%  
Union.....50%  
L. & J. White.....55%

**Planters, Corn, Hand—**  
Kohler's Eclipse..... $\frac{1}{2}$  doz. \$2.00

**Plates—**  
Fellow.....10¢40¢44¢  
Self-Sealing Pie Plates (H. M. Co.)..... $\frac{1}{2}$  doz. \$2.00.....50%

**Pliers and Nippers—**  
Button Pliers.....75¢10¢75¢10¢5¢  
Gas Burner, per doz., 5 in., \$1.25  
Gas Pipe.....7 8 10 12 in.  
\$2.00 \$2.25 \$2.75 \$3.50

**Acme Nippers—**  
Cronk & Carrier Mfg. Co.:  
American Button.....75¢10¢  
Cronk's.....50%  
Stub's Pattern.....50%  
Combination and others.....33%  
Heller's Farriers' Nippers, Pincers,  
and Tools.....40%50¢10¢5¢  
The Nettleton Mfg. Co. Reversible  
Cutting Nippers.....40%  
P. S. & W. Timmers' Cutting Nip-  
pers.....40%  
Wm. Schellhorn Co.:  
Bernard, 33% Lodi, 50%  
Paragon, 60% Lodi, 50%  
Swedish Side, End and Diagonal Cot-  
ting Pliers.....50%  
Utica Forge & Tool Co.:  
Pliers and Nippers, all kinds.....40%

**Plumbs and Levels—**  
Chapin-Stephens Co.:  
Plumbs and Levels.....30¢30¢10¢5¢  
Chapin's Imp. Brass Cor. 40¢10¢10¢  
Pocket Levels.....30¢30¢10¢5¢  
Extension Sights.....30¢30¢10¢5¢  
Machinists' Levels.....40¢40¢10¢  
Diston's Plumbs and Levels.....67%  
Diston's Pocket Levels.....67%  
C. E. Jennings & Co.'s Iron, Adjust-  
able.....50%  
Stanley R. & L. Co.:  
Stanley's Duplex.....35%  
Woods' Extension.....33%

**Poachers, Egg—**  
Buffalo Steam Egg Poachers, No. 3,  
No. 1, \$6.00; No. 2, \$9.00; No. 3,  
\$9.00; No. 4, \$12.00.....50%

**Points, Glaziers—**  
Bulk and 1-lb. papers.....10¢10¢  
1/2 lb. papers.....10¢10¢  
1/4 lb. papers.....10¢10¢

**Pokes, Animal—**  
Ft. Madison Hawkeye..... $\frac{1}{2}$  doz. \$3.25  
Ft. Madison Western..... $\frac{1}{2}$  doz. \$4.00

**Police Goods—**  
Manufacturers' Lists.....50¢25¢45¢  
Tower's.....25%

**Polish—Metal, Etc—**  
Glasbrite, No. 2, 5 lb can (powder),  
each, \$1.25;  $\frac{1}{2}$  doz. \$12.00; No. 2, 10 lb  
can (cake), each, \$2.50;  $\frac{1}{2}$  doz. \$24.00.  
Prestoline Liquid, No. 1 (1/2 pt.),  $\frac{1}{2}$   
doz., \$3.00; No. 2 (1 qt.), \$9.00, 40%  
Prestoline Paste.....40%  
George William Hoffman:  
U. S. Metal Polish Paste, 3 oz.  
boxes,  $\frac{1}{2}$  doz. 50¢;  $\frac{1}{2}$  gr. \$1.50;  
1 lb boxes,  $\frac{1}{2}$  doz. \$1.25; 1 lb  
boxes,  $\frac{1}{2}$  doz. \$2.25.  
U. S. Liquid, 8 oz. cans,  $\frac{1}{2}$  doz.,  
\$1.25.  
Barkeepers' Friend Metal Polish,  $\frac{1}{2}$   
doz., \$1.75.

**Stove—**  
Black Eagle Benzine Paste, 5 lb cans,  
each, \$1.25;  $\frac{1}{2}$  doz. \$10.00  
Black Eagle, Liquid, 1/2 pt. cans,  
each, 75¢  
Black Kid Paste, 1/2 lb cans, each, \$3.00  
Black Kid Paste, 5 lb cans, each, \$9.50  
Ladd's Black Beauty Liquid, per  
100 tins, each, \$5.75  
Joseph Dixon's,  $\frac{1}{2}$  gr. \$5.75.....10%  
Dixon's Plumbago.....10%  
Fireside..... $\frac{1}{2}$  gr. \$2.50  
Gem,  $\frac{1}{2}$  gr. \$1.50.....10%  
Japanese..... $\frac{1}{2}$  gr. \$3.50  
Jet Black..... $\frac{1}{2}$  gr. \$3.50  
Peerless Iron Enamel, 10 oz. cans,  
each, \$1.50  
Wynn's Black Silk:  
Paste, cans,  $\frac{1}{2}$  doz., 5 oz., \$0.75;  
1/2 lb, \$1.00; 1 lb, \$1.75  
Paste,  $\frac{1}{2}$  lb cans, each, \$0.75  
Liquid, cans,  $\frac{1}{2}$  doz., 5 oz., \$0.75;  
1/2 pt., \$1.00; 1 pt., \$1.75  
Steel Range Enamel,  $\frac{1}{2}$  doz., 1/2 pt.,  
\$1.00; 1/2 pt., \$1.25.

**Poppers, Corn—**  
1 qt. Square.....gro. \$8.50  
1 qt. Round.....gro. \$9.50  
1/2 qt. Square.....gro. \$10.50  
2 qt. Square.....gro. \$12.50

**Post Hole and Tree Au-  
gers and Diggers—**  
See also Diggers, Post Hole, &c.

**Pots, Steel—**  
Steel Fence Posts, each, 5 ft., 42¢;  
5 ft., 44¢; 6 ft., 46¢  
Steel Hitching Posts.....each \$1.30

**Potato Parers—**  
See Parers, Potato.

**Pots, Glue—**  
Enamelled.....35¢10%  
Tinned.....30¢10%

**Powder—**  
In Canisters:  
Duck, 1 lb.....each 45¢  
Fine Sporting, 1 lb.....each 75¢  
Rifle, 1/2 lb.....each 15¢  
Rifle, 1 lb.....each 25¢

**In Kegs:**  
25-lb. kegs.....\$3.50  
25-lb. kegs.....\$4.50  
King's Semi-Smokeless:  
Keg (25 lb bulk).....\$6.50  
Half Keg (12 1/2 lb bulk).....\$3.50  
Quarter Keg (6 1/4 lb bulk).....\$1.90  
Case 24 (1 lb cans bulk).....\$3.50  
Half case (1 lb cans bulk).....\$1.75  
King's Smokeless: Shot Gun:  
Keg (25 lb bulk).....\$12.00 \$15.00  
Half Keg (12 1/2 lb bulk).....6.25 7.75  
Quarter Keg (6 1/4 lb bulk).....3.25 4.00  
Case 24 (1 lb cans bulk).....14.00 17.00  
Half case 12 (1 lb c. bks.).....7.25 8.75  
Robin Hood Smokeless Shot Gun.....50¢20%

**Presses—**  
Fruit and Jelly—  
Enterprise Mfg. Co.....30¢25%  
Seal Presses  
Morrill's No. 1,  $\frac{1}{2}$  doz., \$20.00.....50%

**Pruning Hooks and Shears**  
See Shears.

**Pullers, Nail—**  
Cyclops.....50%  
Miller's Falls, No. 3,  $\frac{1}{2}$  doz., \$12.00,  
33%10%  
Morrill's No. 1, Nail Puller,  $\frac{1}{2}$  doz.,  
\$20.00.....50%  
Pearson No. 1, Cyclops Splice Puller,  
each \$30.00.....50%  
Scranton, Case Lots:  
No. 2B (large).....\$5.50  
No. 3B (small).....\$5.50  
Smith & Hemenway Co.:  
Diamond B, case lots,  $\frac{1}{2}$  doz., Large,  
\$9.00; Small, \$7.50.  
Giant No. 1,  $\frac{1}{2}$  doz., \$18; No. 1 1/2,  
\$16.50; No. 3, \$15.....33%  
Staple Pullers, Utica and Davi-  
son.....60%  
Parrot Tack and Stub Puller,  $\frac{1}{2}$  doz.,  
75¢;  $\frac{1}{2}$  gr., \$6.00

**Pulleys, Single Wheel—**  
Inch.....1 1/2 1 3/4 2 3  
Avening or Tackle,  
doz. ....\$0.30 .15 .60 1.05  
Hay Fork, Sichel or Solid Eye,  
doz., 4 in., \$1.25; 5 in., \$1.55  
Inch.....2 1/2 1 1/2 2 1/2  
Hot House, doz., \$0.65 \$1.25 1.80  
Inch.....1 1/2 1 1/2 2 1/2  
Screw, doz., \$0.16 .19 .33 .30  
Inch.....1 1/2 1 1/2 2 1/2  
Side, doz., \$0.25 .40 .55 .60  
Inch.....1 1/2 1 1/2 2 1/2  
Stowell's:  
Ceiling or End, Anti-Friction, 60¢10%  
Dumb Waiter, Anti-Friction, 60¢10%  
Electric Light.....60¢10%  
Side, Anti-Friction.....60¢10%

**Sash Pulleys—**  
Common Frame: Square or  
Round End, per doz, 1 1/2 and  
2 in. ....16¢19¢  
Auger Mortise, no Face Plate,  
per doz., 1 1/2 and 2 in. ....17¢19¢  
Acme.....1 in., 16¢; 2 in., 19¢  
Fox-All-Steel, Nos. 3 and 1, 2 in.,  
doz. 50%

Grand Rapids All Steel Noiseless.....50%  
Ideal.....70¢5%  
Niagara.....1 1/2 in., 16¢; 2 in., 19¢  
No. 26, Troy.....1 1/2 in., 14¢; 2 in., 16¢  
Star.....1 1/2 in., 16¢; 2 in., 19¢  
Tackle Blocks—See Blocks.

**Pumps—**  
Cistern.....60%  
Pitcher Spout.....75¢5¢10%  
Wood Pumps, Tubing, &c. 45¢50%  
Barnes Dbl. Acting (low list).....50%  
Barnes' Pitcher Spout.....75¢10¢5%  
Contractor's Rubber Diaphragm No.  
2, B. & L. Block Co.....\$16.00  
Daisy Spray Pump..... $\frac{1}{2}$  doz. \$6.50  
Flint & Walling's, Fast Mail Hand,  
(low list).....55%  
Flint & Walling's Fast Mail (low  
list).....55%  
Flint & Walling's Tight Top Pitcher,  
75¢10¢5%  
National Specialty Mfg. Co., Measur-  
ing, Nos. 2, \$6.00; 3, \$5.50.....30%  
Myers' Pumps (low list).....50%  
Myers' Power Pumps.....50%  
Myers' Spray Pumps.....50%

**Pump Leathers—**  
Plunger and Lower Valve—Per  
gro.:  
Inch... 2 2 1/2 3 3 1/2  
\$2.20 2.50 2.75 3.00  
Inch... 3 3 1/2 3 3/4 4  
\$3.30 3.60 3.85 4.10 4.40  
Plunger Cup Leathers—Per 100:  
Inch... 2 3 3 1/2 4  
\$2.75 3.85 5.00 6.00

**Punches—**  
Saddlers' or Drive, good.....doz. 50¢75¢  
Spring, single tube, good qual-  
ity.....\$1.75\$2.00  
Revolving (4 tubes).....doz. \$3.50\$3.75  
Bemis & Call Co.'s Cast St'l Drive.....50%  
Morrill's Nos. 1A, 1A, 1B, 1C,  
1D.....50%  
Hercules, 1 die, each \$5.00.....50%  
Niagara Hollow Punches.....40%  
Niagara Solid Punches.....55¢10%  
Wm. Schellhorn Co.:  
Belt and Ticker, Bernard, 33%  
Paragon, 50% Lodi, 50%  
Timmers' Hollow, P. S. & W. Co. 33%  
Timmers' Solid, P. S. & W. Co. 50%  
doz., \$1.44.....50%

**Rail—Barn Door, &c.—**  
Sliding Door, Painted Iron.....2 1/2¢2 3/4¢  
Sliding Door, Wrought Brass,  
1 1/2 in., lb., 56¢.....30%  
Arch Mfg. Co.: Reliable Hanger  
Track.....50%  
Cronk's:  
Double Braced Steel Rail,  $\frac{1}{2}$  ft. 2 1/2 c  
O. N. T. Rail.....2 1/2 c  
Griffin's:  
xxx,  $\frac{1}{2}$  100 ft., 1 x 3-16 in., \$3.00;  
1 1/2 x 3-16 in., \$3.50;  
Hinged Hanger,  $\frac{1}{2}$  100 ft., 1 x 3-16  
in., \$3.10; 1 1/2 x 3-16 in., \$3.80.  
Lane's:  
Hinged Track,  $\frac{1}{2}$  100 ft., 1 in., \$3.40;  
1 1/2 in., \$3.90.  
O. N. T.  $\frac{1}{2}$  100 ft., 1 in., \$3.00; 1 1/2  
in., \$3.00; 1 1/2 in., \$4.00;  
Standard, 1 1/2 in.,  $\frac{1}{2}$  100 ft. \$4.00  
Lawrence Bros.:  
 $\frac{1}{2}$  100 ft. No. 201, \$4.00; No. 202, \$4.00  
New York, 1 x 3-16 in.,  $\frac{1}{2}$  100 ft. \$3.00  
McAnaney's:  
Hinged Hanger Rail,  $\frac{1}{2}$  ft. 1 1/2 c, 50%  
None Better..... $\frac{1}{2}$  ft. 3 1/2 c  
Standard..... $\frac{1}{2}$  ft. 4 c  
Myers' Scayon Track.....60¢10%  
Richards' Mfg. Co.:  
Common, 1 x 3-6 in., \$3.00; 1 1/2 x  
3-6 in., \$3.25; 1 1/2 x 3-16 in., \$3.50.  
Special Hinged Rail.....60¢10%  
Lag Screw Rail, No. 65.....50%  
Gauge Trolley Track,  $\frac{1}{2}$  ft. No. 31,  
5¢; No. 32, 1 1/2¢; No. 33, 20¢.  
No. 50.....60¢10%  
Nos. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,  
\$4.00; 45, \$3.25; 46, \$3.50; 49, No. 1,  
\$3.25; 49, No. 2, \$3.50.  
Stowell's:  
Cast Rail..... $\frac{1}{2}$  ft. 2 1/2 c  
Steel Rail, Plain.....25%  
Wrought Bracket, 1 3-16 in.,  $\frac{1}{2}$  ft. 3 c  
Wrought Bracket, 1 1/2 x 5-16 in.,  $\frac{1}{2}$  ft. 3 c  
Sweet's Hylo,  $\frac{1}{2}$  ft. 1 1/2 c.....60%  
E. L. Steel Rail..... $\frac{1}{2}$  100 ft. \$2.30  
No. 0, 1 x 3-16 in.,  $\frac{1}{2}$  100 ft. \$3.00

**Rakes—**  
NOTE.—Many goods are sold  
at net prices.  
Fort Madison Red Head Lawn.....\$3.25  
Fort Madison Blue Head Lawn.....\$2.70  
Jackson Lawn, 29 and 30 teeth,  $\frac{1}{2}$   
doz., net.....\$4.25  
Cronk's:  
New Champion Garden,  $\frac{1}{2}$  doz., 12  
teeth, \$15.00; 14, \$16.50; 16, \$18.00. 75%  
Victor Garden,  $\frac{1}{2}$  doz., 12 teeth,  
\$15.00; 14, \$16.50; 16, \$18.00. 80%  
Queen City Lawn,  $\frac{1}{2}$  doz., 20 teeth,  
\$2.85; 24, \$3.00.....net  
Anticlog Lawn,  $\frac{1}{2}$  doz.....\$1.90  
Malleable Garden,  $\frac{1}{2}$  doz., 12 teeth,  
\$15.00; 14, \$16.50; 16, \$18.00. 80%  
Kohler's:  
Lawn Queen, 20-tooth..... $\frac{1}{2}$  doz. \$2.90  
Lawn Queen, 24-tooth..... $\frac{1}{2}$  doz. \$3.00  
Paragon, 20-tooth..... $\frac{1}{2}$  doz. \$2.70  
Paragon, 24-tooth..... $\frac{1}{2}$  doz. \$2.75  
Steel Garden, 14-tooth..... $\frac{1}{2}$  doz. \$2.49  
Malleable Garden, 14-tooth,  $\frac{1}{2}$  doz.  
\$1.75\$2.00

**Rasps, Horse—**  
Disston's.....75%  
Heller Rex.....75%  
Liveright Bros. Gold Medal 70¢10¢75%  
New Nicholson.....70¢10¢75%  
See also Files.

**Razors—**  
Liana Bo-ras-le.....60%  
Fox Razors,  $\frac{1}{2}$  doz., No. 62, \$9.00;  
No. 44, \$3.00; No. 62, Platina, } 50%  
Red Devil.....50%

Silberstein:  
Carbo Magnetic, \$21.00; Grifffon, No.  
65, \$13.50; Grifffon, No. 60, \$12.00;  
all other Razors, 40%.

**Safety Razors—**  
Kampfe Bros.:  
Star Safety, 25%; Star Interchange-  
able, 25%; Star Safety Corn, 25%.  
Silberstein.....40%

**Reels, Fishing—**  
Hendryx:  
M 6, Q 6, A 6, B 6, M 9 1/2, M 16,  
Q 16, A 16, B 16, 4008, Rubber,  
Popolo, Nicked Popolo.....20%  
Aluminum German wir., Bronze 25%  
1240 N, 124 N.....20%  
3001 N, 06 N, C RM, G 9.....25%  
4 N, 6 P N, 24 N, 26 P N.....20%  
2301 P, 33 1/2%; 2301 P N, 33 1/2%; 0924 N,  
33 1/2%; 0204 N, 33 1/2%; 002301 P N,  
33 1/2%; 802 N, 33 1/2%  
986 P N, 294 N, 914 P N.....25%  
5009 P N, 5009 N.....20%  
Competitor, 102 P, 102 P N, 202 P,  
202 P N, 102 P R, 202 P R.....20%  
304 P, 304 P N, 00304 P, 00304 P N, 33 1/2%

**Registers—List July 1, 1903.**  
Japanned, Electroplated and  
Bronzed.....70%  
White Porcelain Enamel.....60%  
Solid Brass or Bronze Metal,  
40¢10%

**Revolvers—**  
Single Action.....93¢\$1.00  
Double Action, except 4 1/2 cal. \$1.85  
Double Action, 4 1/2 caliber.....\$2.00  
Automatic.....\$3.25  
Hammerless.....\$3.75

**Riddles, Hardware Grade**  
16 in.....per doz. \$2.50\$2.75  
17 in.....per doz. \$2.75\$3.00  
18 in.....per doz. \$3.00\$3.25

**Rings and Ringers—**  
Bull Rings—  
Steel.....\$0.70 0.75 0.80 doz.  
Copper.....\$1.00 1.15 1.40 doz.  
Rea's Improved Self-Piercing,  $\frac{1}{2}$  doz.,  
Copper, 2 in., \$1.25; 2 1/2 in., \$1.50;  
3 in., \$1.75.  
Hog Rings and Ringers—  
Hill's Rings, gro. boxes \$1.00\$1.50  
Hill's Ringers, Gray Iron.....doz. 50¢55¢  
Hill's Ringers, Malleable Iron.....doz. 70¢75¢  
Blair's Rings...per gro. \$1.75\$5.25  
Blair's Ringers, per doz. \$0.60\$1.65  
Brown's Rings...per gro. \$0.45\$0.50  
Brown's Ringers, per doz. \$0.60\$1.65

**Rivets and Burrs—**  
Copper.....40¢2 1/2%  
Carriage, Coopers, Timmers, &c.:  
Black.....70¢10%  
Metallic Tinned.....70%  
Bifurcated and Tubular—  
Assorted in Boxes.  
Bifurcated, per doz. boxes, paste-  
board boxes, 25¢25¢; Tin boxes,  
29¢32¢.  
Tubular, per doz. boxes, 50 count,  
2¢; 100 count, 51¢58¢.

**Rollers—**  
Acme, Stowell's Anti-Friction.....50%  
Cronk's Stay No. 65, \$0.90; No.  
50.....\$1.00  
Cronk's Brinkerhoff No. 55, \$0.60;  
No. 50.....\$0.84  
Lane's Stay.....40%  
Richards' Stay:  
Handy Adj. and Reversible No. 53, 75¢  
O. K. Adj. and Reversible No. 98, 50¢  
Lag Screw, Nos. 55 and 57.....50%  
Underwriters', Nos. 50, 60.....50%  
Favorite, No. 54.....50%  
Stowell's Barn Door Stay,  $\frac{1}{2}$  doz. \$1.00  
Sweet's Anti-Friction..... $\frac{1}{2}$  doz. 85¢  
Screw and Spike Stay..... $\frac{1}{2}$  doz. 85¢  
Hinge Adjustable Stay..... $\frac{1}{2}$  doz. 90¢

**Rope—**  
Manila, 7-16 in. diam. and larger:  
Pure.....1b., 12 1/2¢13¢  
Sisal, 7-16 in. diam. and larger:  
Pure.....1b., 9 1/4¢  
Sisal, 7-16 in. diam. and larger:  
No. 3 quality.....1b., 8¢  
Sisal, Hay, Hide and Bale  
Ropes, Medium and Coarse:  
Mixed.....1b., 8¢  
Pure.....1b., 9 1/4¢  
Sisal, Tarred, Medium Lath  
Yarn, Coarse and Untarred:  
Mixed.....1b., 7 1/2¢  
Pure.....1b., 8¢  
Cotton Rope:  
Best, 1/4-in. and larger.....17¢18¢  
Medium, 1/4-in. and larger, 18¢18¢  
Common, 1/4-in. and larger, 10¢  
In coils, 1/2¢ advance.

**Jute Rope:**  
Thread, No. 1, 1/4-in. & up, lb.,  
8 1/4¢(8 1/2¢)  
Thread, No. 2, 1/4-in. & up, lb.,  
7 1/2¢(8¢)

**Old Colony Manila Transmission  
Rope..... $\frac{1}{2}$  lb. 17 1/2¢**

**Wire Rope—**  
Galvanized.....37 1/2¢2 1/4%  
Plain.....45¢2 1/4%  
**Ropes, Hammock—**  
Covert Mfg. Co.:  
Jute 35%; Sisal.....25%

**Rules**  
Boxwood.....60¢60¢10%  
Iron.....35¢10¢35¢10¢5%  
Chapin-Stephens Co.:  
Boxwood.....60%  
Flexfold.....27 1/4¢10¢10%  
Ivory.....35¢35¢10¢10%  
Miscellaneous.....50¢35¢10¢10%  
Stephens' Combination.....55¢55¢10%  
Stationers'.....10¢10¢10%



Keuffel & Esser Co.: .....	35&10%
Folding, Wood.....	35&10%
Folding, Steel.....	33&10%
Lufkin's Steel.....	55&10%
Lufkin's Lumber.....	60%
Stanley R. & L. Co.: .....	60%
Boxwood.....	60%
Ivory.....	45%
Miscellaneous.....	60%
Zig Zag.....	40%
Zig Zag, Pin Joint.....	42&10%
Union Nut Co.: .....	60&10%
Boxwood.....	35&10%
Ivory.....	35&10%

**Sash Balances—**

See Balance, Sash.

**Sash Locks—**

See Locks, Sash.

**Sash Weights—**

See Weights, Sash.

**Sausage Stuffers or Fillers**

See Stuffers or Fillers, Sausage.

**Saw Frames—**

See Frames, Saw.

**Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.****Saws—**

Atkins': .....	50%
Band.....	50&10%
Butcher Saws.....	50%
Cross Cuts.....	35%
One-Man Cross Cut.....	40%
Narrow Cross Cut.....	50%
Hand, Rip and Panel.....	40%
Miter Box and Compass.....	40%
Mitney, Mill and Drag.....	50%
Chapin-Stephens Co.: .....	30&10%
Turning Saws and Frames.....	30&10%
Diamond Saw & Stamping Works.....	30&10%
Sterling Kitchen Saws.....	30&10%
Diston's: .....	50%
Circular, Solid and Ins'ted Tooth.....	50%
Hand, 2 to 14 in. wide.....	50%
Band, 1/4 to 1 1/2.....	50%
Crosscuts.....	45%
Narrow Crosscuts.....	50%
Mitney, Mill and Drag.....	50%
Framed Woodaws.....	50%
Woodaw Blades.....	50%
Woodaw Hods.....	50%
Hand Saws, Nos. 12, 9, 8, 16, 10, 10, 12, 16, 17, 8.....	50%
Hand Saws, Nos. 7, 10, 10 1/2, 3, 5, 7, 8, 10, 12, 16, 17, 8.....	50%
Compass, Key Hole &c.....	50%
Butcher Saws and Blades.....	50%
C. E. Jennings & Co.'s: .....	50%
Back Saws.....	50%
Butcher Saws.....	50%
Compass and Key Hole Saws.....	50%
Framed Wood Saws.....	50%
Hand Saws.....	50%
Wood Saw Blades.....	50%
Millers Falls: .....	50%
Butcher Saws.....	50%
Star Saw Blades.....	50%
Massachusetts Saw Works: .....	50%
Victor Kitchen Saws.....	50%
Butcher Saws and Blades.....	50%
Pence & Richardson's Hand Saws.....	50%
Simonds': .....	50%
Circular Saws.....	50%
Crescent Ground Cross Cut Saws.....	50%
One-Man Cross Cut Saws.....	50%
Gang Mill, Mulay and Drag Saws.....	50%
Band Saws.....	50%
Back Saws.....	50%
Butcher Saws.....	50%
Hand Saws.....	50%
Hand Saws, Bay State Brand.....	50%
Compass, Key Hole, &c.....	50%
Wood Saws.....	50%
Wheeler, Madden & Clemens Mfg. Co.'s Cross Cut Saws.....	50%

**Hack Saw Blades and Frames—**

Atkins' Hack Saw Blades A A A.....	25%
Diston's: .....	50%
Concave Blades.....	50%
Keystone Blades.....	50%
Hack Saw Frames.....	50%
Simonds' File Co.: .....	50%
C. E. Jennings & Co.'s: .....	50%
Hack Saw Frames, No. 175, 180.....	50%
Hack Saws, Nos. 175, 180, complete.....	50%
Goodell's Hack Saw Blades.....	50%
Griffin's Hack Saw Blades.....	50%
Star Hack Saws and Blades.....	50%
Sterling Hack Saw Blades.....	50%
Sterling Hack Saw Frames.....	50%
Sterling Power Hack Saw Machines.....	50%
each, No. 1, \$25.00; No. 2, \$30.00.....	50%
Victor Hack Saw Blades.....	50%
Victor Hack Saw Frames.....	50%

**Scroll—**

Barnes, No. 7, \$15.....	35%
Barnes' Scroll Saw Blades.....	40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, \$18.....	25%
with boring attachment, \$20.....	25%
1 ester, complete, \$10.....	15&10%
Rogers, complete, \$3.50 and \$4.00.....	15&10%

**Scales—**

Family, Turnbills..... 50&amp;10%

**Counter:**

Hatch, Platform, 1/4 oz. to 4 lb..... 50%

Two Platforms, 1/4 oz. to 8 lb..... 50%

Union Platform, Plain \$1.70 \$2.15..... 50%

Union Platform, Stpd \$1.85 \$2.15..... 50%

Chattillon's..... 50%

Eureka..... 50%

Favorite..... 50%

Crocker's Trip Scales..... 50%

Chicago Scale Co.: .....
The Little Detective.....	35 lb 50%
Union or Platform No. 2.....	50%
Portable Platform (reduced list).....	25&10%
Wagon or Stock (reduced list).....	25&10%
The Standard Portables.....	40%
The Standard R. R. and Warehouse.....	50&10%
**Scrapers—**

Box, 1 Handle..... 25%

Box, 2 Handle..... 25%

Ship..... Light, \$2.00; Heavy, \$4.50

**Adjustable Box Scraper (S. R. & L. Co.)**

Box, \$6.00..... 50%

**Chapin-Stephens Co., Box.....**

Box, \$3.00..... 50%

**Screws—Bench and Hand**

Bench, Iron, doz., 1 in., \$2.50..... 50%

2 1/2; 1 1/2, \$3.00; 3 1/2; 1 1/4, \$3.50..... 50%

Bench, Wood..... 20&amp;10%

Hand, Wood..... 20&amp;10%

R. Bliss Mfg. Co., Hand..... 20&amp;10%

Chapin-Stephens Co., Hand..... 20%

**Coach, Lag and Hand Rail—**

Lag, Cone Point, list Oct. 1..... 75&amp;15%

Coach, Gimlet Point, list Oct. 1, '99..... 75&amp;10%

Hand Rail, list Jan. 1, '81..... 70&amp;10%

**Jack Screws—**

Standard List..... 75%

Millers Falls..... 50&amp;10%

P. S. &amp; W..... 75&amp;80%

**Machine—**

List Jan. 1, '98..... 75&amp;10%

Flat or Round Head, Iron..... 50&amp;10%

Flat or Round Head, Brass..... 50&amp;10%

**Set and Cap—**

Set (Iron)..... 75&amp;10%

Set (Steel), net advance over Iron..... 25%

Sq. Hd. Cap..... 70&amp;10%

Hex. Hd. Cap..... 70&amp;10%

Rd. Hd. Cap..... 50&amp;10%

Fillister Hd. Cap..... 60&amp;10%

**Wood—**

List July 23, 1905..... 50%

Flat Head, Iron..... 87&amp;10%

Round Head, Iron..... 85&amp;10%

Flat Head, Brass..... 82&amp;10%

Round Head, Brass..... 80&amp;10%

Flat Head, Bronze..... 77&amp;10%

Round Head, Bronze..... 75&amp;10%

Drive Screws..... 87&amp;10%

**Scroll Saws—**

See Saws, Scroll.

**Scythes—**

Grass, No. 1, Plain..... \$6.25 @ 6.75

Clipper, Bronzed Webb..... \$6.50 @ 7.00

No. 3 Clipper, Pol'd Webb..... \$6.75 @ 7.25

No. 6 Clipper and Solid Steel..... \$7.00 @ 7.50

Bush, Weed and Bramble, No. 2..... \$6.50 @ 7.00

Grain, No. 1..... \$8.25 @ 8.75

Bronzed Webb, No. 1..... \$8.50 @ 9.00

Nos. 3 and 4 Clipper, Grain..... \$8.75 @ 9.25

Solid Steel, No. 6..... \$9.25 @ 9.75

**Seeders, Raisin—**

Enterprise..... 25&amp;30%

**Sets—Aul and Tool—**

Fray's Adj. Tool Handles, No. 1, \$12; 2, \$18; 3, \$12; 4, \$9; 5, \$7..... 50%

C. E. Jennings &amp; Co.'s Model Tool Holders..... 50%

Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18..... 50%

**Garden Tool Sets—**

Pt. Madison Three Plows, Hoe, Rake and Shovel..... \$9 doz sets \$9.00

**Sets, Nail—**

Octagon..... gro. \$3.50 @ 3.75

Huck Bros..... 25%

Canon's Diamond Point, \$9 doz..... \$12.00

Mayhew's \$9 doz..... \$9.00

Suehl's Corrugated Cup Pt..... \$9 doz..... \$9.00

Suehl's Knurled Cup Pt..... \$9 doz..... \$9.00

Victor Knurled Cup Pt..... \$9 doz..... \$9.00

**Rivet—**

Regular list..... 75&amp;10%

**Saw—**Atkins': .....
Criterion.....	40%
Adjustable.....	40%
Diston's Star, Monarch and Triumph.....	30%
Morrill's No. 1.....	\$15.00
No. 3 and 4, Cross Cut.....	\$20.00
No. 5, Mill.....	\$30.00
No. 10, 11, 95.....	\$15.00
No. 1 Old Style.....	\$10.00
Special.....	\$16.25
Giant Royal Cross Cut.....	\$8 doz \$8.00
Royal, Hand.....	\$4 doz \$4.00
Taintor Positive.....	\$4 doz \$4.75
**Shaving—**

Fox Shaving Sets, No. 30..... 50%

Smith &amp; Hemenway Co.'s..... 60%

**Sharpeners, Knife—**

Chicago Wheel &amp; Mfg. Co..... 70%

Pike Mfg. Co.: .....
Past Cut Pocket Knife Hones.....	\$1.50
Mounted Kitchen Sand Stone.....	\$1.50
Natural Grit Carving Knife.....	\$3.00
Hones.....	\$3.00
Quick Cut Emery Carving Knife Hones.....	\$1.50
Quick Edge Pocket Knife Hones.....	\$2.50
**Skate—**

Smith &amp; Hemenway Co., Eureka..... 20%

**Shaves, Spoke—**

Iron..... doz \$1.10 @ 1.25

Wood..... doz \$1.75 @ 2.25

Bailey's (Stanley R. &amp; L. Co.)..... 45%

Razor Edge (Stanley R. &amp; L. Co.)..... 55%

Chapin-Stephens Co..... 30&amp;10%

Goodell's \$9 doz..... \$9.00

Wood's P1 and P2..... 50%

**Shears—**

Cast Iron..... 7 8 9 in.

Best..... \$16.00 12.00 20.00 gro.

Good..... \$13.00 15.00 17.00 gro.

Cheap..... \$5.00 6.00 7.00 gro.

Straight Trimmers, &amp;c.....

Best quality Jan..... 70&amp;10%

Best quality Nickel..... 60&amp;10%

Fair quality Jan..... 50&amp;10%

Fair quality Nickel..... 75&amp;10%

**Tailors' Shears..... 40&10%**

Acme Cast Shears..... 40&amp;10%

Heinrich's Tailor's Shears..... 10%

Wilkinson Shear & Cutlery Co.: .....
Sheep, 1800 list.....	30&10%
Grass.....	50&10%
Horse or Mule.....	50&10%
**Tinners' Snips—**

Steel Blades..... 20&amp;10%

Steel Laid Blades..... 40&amp;10%

Forged Handles, Steel Blades, Berlin..... 50%

Heinrich's Snips..... 40%

Jennings &amp; Griffin Mfg. Co.'s 6 1/2 to 10 in..... 50%

Niagara Snips..... 40%

P. S. &amp; W. Forged Handles..... 20%

**Pruning Shears—**

Cronk's Hand Shears..... 33%

Cronk's Wood Handle Shears..... 33%

Diaston's Combined Pruning Hook and Saw..... 25%

Diaston's Pruning Hook only..... 25%

John T. Henry Mfg. Co.: .....
Pruning Shears, all grades.....	50%
P. S. & W. Co.: .....	30%
Wilkinson Shear & Cutlery Co.: .....	60&10%
Hedge, Wilcut Brand.....	60&10%
Lawn and Border, Wilcut Brand.....	60&10%
**Sheaves—Sliding Door—**

Stowell's Anti-Friction..... 50%

Reading..... 40%

R. &amp; E. list..... 15%

Wrightsville Hatfield Pattern..... 80%

**Sliding Shutter—**

Reading..... 40%

R. &amp; E. list..... 10%

**Shells—Shells, Empty—**

Brass Shells, Empty:

Climax, 10 and 12 gauge..... 55&amp;10%

Club, Rival, 65&amp;5%; First Quality..... 60&amp;5%

Paper Shells, Empty:

New Rapid, 10, 12, 16 and 20 gauge..... 55&amp;10%

Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade..... 55&amp;5%

Union, League, 12 and 12 gauge..... 25%

Rival Grade, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge..... 30&amp;5%

Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..... 20%

Expert, 10, 12, 16 and 20 gauge..... 33&amp;5%

Robin Hood, Low Brass..... 20&amp;5%

Robin Hood, High Brass..... 30&amp;5%

Indian, for Black Powder..... 55&amp;5%

**Shells, Loaded—**

Loaded with Black Powder..... 40%

Loaded with Smokeless Powder, medium grade..... 40&amp;5%

Loaded with Smokeless Powder, high grade..... 40&amp;10%

Robin Hood:

Smokeless Robin Hood, Low Brass..... 50%

Smokeless Comets, High Brass..... 50&amp;10%

Indian, Black Powder..... 40&amp;5%

Winchester:

Smokeless Repeater Grade..... 40&amp;5%

Smokeless Leader Grade..... 40&amp;10%

Black Powder..... 40%

**Shingles, Metal—Per Sq.**Edwards Mfg. Co.: .....
Painted.....	Galv.
14 x 20.....	\$1.25 \$6.00
10 x 14.....	4.50 6.25
7 x 10.....	4.75 6.50
Wheeling Corrugating Co.: .....	
Tin Painted, Galv.	
Dixie, 14 x 20 in.....	\$4.25 \$5.50
Dixie, 10 x 14 in.....	4.50 6.00
Dixie, 7 x 10 in.....	5.00 6.75
**Shoes, Horse, Mule, &c.—**

F.O.B. Pittsburgh:

Iron..... per keg \$4.00

Steel..... per keg \$7.75

Burden's, all sizes..... \$9 keg \$3.90

**Shot—**

25-lb. bag.....

Drop, up to B..... \$1.90

Drop, B and larger..... 2.15

Buck..... 2.15

Chilled..... 2.15

Dust..... 2.35

**Shovels and Spades—**

Association List, Nov. 15, 1902..... 40%

**Snow Shovels—**

**Scythe Stones**—  
Chicago Wheel & Mfg. Co.:  
Gem, 10 in., \$8.00; 12 in., \$10.80.  
Norton Aluminum Scythe Stones:  
Less than 10 gross lots, \$6.00  
Lots of 10 gross or more, \$4.50  
Pike Mfg. Co., 1901 list:  
Black Diamond S. S., 10 in., \$12.00  
Lamotte S. S., 10 in., \$11.00  
White Mountain S. S., 10 in., \$9.00  
Green Mountain S. S., 10 in., \$7.50  
Extra Indian Pond S. S., 10 in., \$7.00  
No. 1 Indian Pond S. S., 10 in., \$7.00  
No. 2 Indian Pond S. S., 10 in., \$4.50  
Leader Red End S. S., 10 in., \$4.50  
Quick Cut Emery, 10 in., \$10.00  
Pure Corundum, 10 in., \$18.00  
Crescent, 10 in., \$7.00  
Emery Scythe Rifles, 3 Coat, \$2  
Emery Scythe Rifles, 4 Coat, \$10  
Emery Scythe Rifles, 4 Coat, \$12  
Balance of 1901 list 33 1/2 %  
**Stoppers, Bottle**—  
Victor Bottle Stoppers, 10 in., \$9.00  
**Stops—Bench**—  
Millers Falls, 15 in., \$15.00  
Morrill's, 10 in., \$10.00  
Morrill's, No. 2, \$12.50  
**Door**—  
Chapin-Stephens Co., 10 in., \$10.00  
**Plane**—  
Chapin-Stephens Co., 20 in., \$20.00  
**Straps—Box**—  
Cary's Universal, case lots, \$10.00  
**Stretchers, Carpet**—  
Cast Iron, Steel Points, doz., \$6.00  
**Socket**—  
Bullard, 10 in., \$11.00  
Excelsior Stretcher and Tack Hammer Combined, 10 in., \$6.00  
**Strops, Razor**—  
Star Diagonal Strop, 25 in., \$2.50  
**Stuffers, Sausage**—  
Enterprise Mfg. Co., 25 in., \$7.50  
National Specialty Co., list Jan. 1, 1902, 30 in., \$3.50  
**Sweepers, Carpet**—  
National Sweeper Co.:  
Louis XV, Roller Bearing, Gold Plated, \$120.00  
Hepplewhite, Roller Bearing, Silver Plated, \$72.00  
Sheraton, Roller Bearing, Nickel, \$60.00  
Ye Mission, Roller Bearing, Oxidized Copper, \$36.00  
Transparent, Roller Bearing, Plate Glass top, Nickel, \$36.00  
National Queen, Roller Bearing, Fancy Venetian, \$27.00  
Loyal, Roller Bearing, Venetian, Nickel, \$25.00  
Triple Medal, Roller Bearing, Nickel, \$24.00  
Marion, Roller Bearing, Nickel, \$24.00  
Marion Queen, Roller Bearing, Nickel, \$21.00  
Monarch, Roller Bearing, Nickel, \$22.00  
Monarch, Roller Bearing, Japan, \$20.00  
Perpetual, Regular B's, Japan, \$20.00  
Monarch Extra (17 in. case), Roller Bearing, Nickel, \$38.00  
Monarch Extra (17 in. case), Roller Bearing, Japan, \$33.00  
Auditorium (26 in. case), Roller Bearing, Nickel, \$54.00  
Mammoth (30 in. case), Roller Bearing, Nickel, \$60.00  
**NOTE**—Rebates: 10¢ per dozen on three dozen lots; 1¢ per dozen on five dozen lots; 1¢ per dozen on ten dozen lots; 1¢ per dozen on twenty-five dozen lots.  
**Iron Metal Stamping Co.**:  
Eureka Japanned, 10 in., \$15.00  
Model E, Sanitary, 10 in., \$25.00  
Model A, Stairing, 10 in., \$25.00  
Model B, Sterling, Nickel, 10 in., \$23.00  
Model B, Sterling, Japanned, 10 in., \$21.00  
Model C, Sterling, 10 in., \$21.00  
Model D, Sterling, 10 in., \$19.50  
**Tacks, Finishing Nails, &c.**  
New List, May 1, 1905.  
American Carpet Tacks, 90435 %  
American Cut Tacks, 90435 %  
Suedes Cut Tacks, 90435 %  
Suedes Upholsterers', 90435 %  
Gimp Tacks, 90435 %  
Lace Tacks, 90435 %  
Trimmers' Tacks, 90435 %  
Looking Glass Tacks, 65 %  
Bill Posters' and Railroad Tacks, 90435 %  
Hungarian Nails, 80420 %  
Finishing Nails, 70420 %  
Trunk and Clout Nails, 80 %  
**NOTE**—The above prices are for Standard Weights. An extra 5 % is given on Medium Weights, and an extra 10 % is given on light weights.  
**Miscellaneous**—  
Double Pointed Tacks, 90435 % or 5 tens  
See also Nails, Wire.  
**Tanks, Oil**—  
Emerald, R. M. Co., 30-gal., \$3.40  
Emerald, R. M. Co., 60-gal., \$4.25  
Queen City, R. M. Co., 30-gal., \$3.65  
Queen City, R. M. Co., 60-gal., \$4.50  
**Tapes, Measuring**—  
American Assoc. Skin, 50 ft., \$7.00  
Patent Leather, 25 ft., \$3.45  
Steel, 33 ft., \$3.65  
Chesterman's, 25 ft., \$3.45  
Keuffel & Esser Co.:  
Favorite, Ass Skin, 100 ft., \$5.00  
Favorite, Duck and Leather, 25 ft., \$5.00  
Metallic and Steel, lower list, 35 ft., \$5.50; Pocket, 35 ft., \$5.50  
Lufkin's:  
Asses' Skin, 100 ft., \$5.00

**Metallic**—  
Patent Bend, Leather, 25 ft., \$5.50  
Pocket, 40 ft., \$4.50  
Steel, 33 ft., \$3.45  
Wichman & Hilger:  
Chesterman's Metallic, No. 34L, etc., 25 %  
Chesterman's Steel, No. 10081, etc., 35 %  
**Teeth, Harrow**—  
Steel Harrow Teeth, plain or headed, 1/2-inch and larger, per 100 lbs., \$2.75 to \$3.00  
**Thermometers**—  
Tin Case, 80 in., \$10.00 to \$10.50  
**Ties, Bale—Steel Wire**—  
Single Loop, 80 in., \$2.50  
Monitor, Cross Head, 80 in., 70 %  
**Brick Ties**—  
Niagara Brick Ties, 25 in., 10 %  
**Tinners' Shears, &c.**—  
See Shears, Tinners', &c.  
**Tinware**—  
Stamped, Japanned and Piced, sold very generally at net prices.  
**Tire Benders, Upsetters, &c.**  
See Benders and Upsetters, Tire.  
**Tools—Coopers**—  
Hay—  
Myers' Hay Tools, 50 %  
Stowell's Hay Carriers, 50 %  
Forks, 50 %; Fork Pulleys, 50 %  
**Miniature**—  
Smith & Hemenway Co.'s, Davidson, 25 %  
**Saw**—  
Atkins' Cross Cut Saw Tools, 35 %  
Simonds' Improved, 35 %  
Simonds' Crescent, 25 %  
**Ship**—  
L. & I. J. White, 25 %  
**Transom Lifters**—  
See Lifters, Transom.  
**Traps—Fly**—  
Bullock, Globe or Acme, doz., \$1.15 to \$1.25; gro., \$11.50 to \$12.00  
Harper, Champion or Paragon, doz., \$1.25 to \$1.40; gro., \$13.00 to \$15.50  
**Game**—  
Imitation Onions, 75 in., \$7.50  
Newhouse, 10 in., \$1.50  
Hawley & Norton, 10 in., \$1.50  
Victor, 10 in., \$1.50  
Oneida Community Jump, 50 %  
**Mouse and Rat**—  
Mouse, Wood, Choker, doz. holes, 8 1/2 in., \$1.95  
Mouse, Round or Square Wire, doz. 8 1/2 in., \$1.95  
Marty French Rat and Mouse Trap (Genuine):  
No. 1, Rat, 10 in., \$13.25; case of 50, \$65.00  
No. 2, Rat, 10 in., \$6.50; case of 50, \$32.50  
No. 3, Rat, 10 in., \$5.25; case of 72, \$47.00  
No. 4, Mouse, 10 in., \$3.85; case of 150, \$57.00  
No. 5, Mouse, 10 in., \$3.00; case of 150, \$45.00  
**Trimmers, Spoke**—  
Wood's E, 50 %  
**Trowels**—  
Diastou Brick and Pointing, 25 %  
Diastou Plastering, 20 %  
Diastou "Standard Brand" and Garden Trowels, 30 %  
Kohler's Steel Garden Trowels, 30 %  
5 in., \$4.80; 6 in., \$6.00  
Never-Break Steel Garden Trowels, 30 %  
Rose Brick and Plastering, 25 %  
Woodrough & McFarlin, Plastering, 25 %  
**Trucks, Warehouse, &c.**—  
B. & L. Block Co.:  
New York Pattern, 50 in., 10 %  
Western Pattern, 50 in., 10 %  
Handy Trucks, 10 in., \$16.00  
Grocery, 10 in., \$15.00  
Daisy Stove Trucks, Improved Pattern, 10 in., \$18.50  
McKinney Trucks, 10 in., \$18.00  
Model Store Trucks, 10 in., \$18.50  
**Tubs, Wash**—  
M'Far's list, price per gross.  
No. 1, 1 1/2 3 3  
Galvanized, 5 1/2 5 1/2 5 1/2 10 1/2 %  
Galvanized Wash Tubs (R. M. Co.):  
No. 1, 1 1/2 3 3  
Per doz., net \$5.70 6.30 7.20 6.80 7.20 8.10  
**Twine, Miscellaneous**—  
Flax Twine:  
No. 9, 1/4 and 1/2 lb. Balls, 22 @ 21 1/2  
No. 12, 1/4 and 1/2 lb. Balls, 20 @ 21 1/2  
No. 18, 1/4 and 1/2 lb. Balls, 17 @ 19 1/2  
No. 24, 1/4 and 1/2 lb. Balls, 16 @ 18 1/2  
No. 36, 1/4 and 1/2 lb. Balls, 15 @ 17 1/2  
Chalk Line, Cotton 1/4 lb. Balls, 25 @ 30 1/2  
Cotton Mops, 6, 9, 12 and 15 lb. to doz., 10 @ 18 1/2  
Cotton Wrapping, 5 Balls to lb., according to quality, 1 1/2 @ 2 1/2  
American 2-Ply Hemp, 1/4 and 1/2 lb. Balls, 13 1/2 @ 14 1/2  
Balls, 1 1/2 lb., 11 1/2 @ 12 1/2  
India 2-Ply Hemp, 1/4 and 1/2 lb. Balls (Spring Twine), 11 1/2 @ 12 1/2  
India 3-Ply Hemp, 1/4 lb. Balls, 9 1/2 @ 10 1/2  
India 3-Ply Hemp, 1 1/2 lb. Balls, 9 @ 10 1/2  
E. 3, 1/4 and 3-Ply Jute, 1 1/2 lb. Balls, 11 @ 12 1/2  
Mason Line, Linen, 1/4 lb. Bls., 36 No. 261 Mattress, 1/4 and 1/2 lb. Balls, according to quality, 30 @ 60 1/2  
Wool, 3 to 6 ply, 8 7/4; A 9 1/2  
**Vises**—  
Solid Box, 60 %

**Parallel**—  
Athol Machine Co.:  
Simpson's Adjustable, 40 %  
Standard, 40 %  
Amateur, 25 %  
Columbian Hdw. Co., 40 %  
Emmert Universal:  
Pattern Makers No. 1, \$13.00; No. 2, \$12.50.  
Machine and Tool Makers No. 1A, \$12.50; No. 6A, \$10.00; No. 10A, \$22.50.  
Presto Quick Acting, Adjustable Jaw, 25 @ 25 1/2; Solid Jaw, 35 @ 35 1/2  
Tiger Machinists', 49 %  
Fisher & Norris Double Screw, net, each, Nos. 2, \$10.50; 3, \$16.00; 4, \$20.50; 5, \$27.00.  
Holland's:  
Machinists', 10 @ 14 1/2; 5 @ 10 1/2  
Keystone, 65 @ 70 %  
Lewis Tool Co.:  
Adjustable Jaw, 30 %  
Monarch, 50 %; Solid Jaw, 50 %  
Massey Vise Co.:  
Cinch, 40 %  
Perfect, 15 %; Lightning Grip, 15 %  
Merrill's:  
Millers Falls Oval Slide Pattern, 60 @ 10 %  
Parker's:  
Victor, 20 @ 25 %; Regulars, 20 @ 25 %  
Volcan's:  
Combination Pipe, 10 @ 45 %  
Prestiss, 20 @ 25 %  
Suediker's X. L., 33 1/2 %  
Stephens', 33 1/2 %  
**Saw Filers**—  
Diston's 1) 3) Clamp and Guide, 30 doz., \$24.00; 30 %  
Perfection Saw Clamps, 10 doz., \$4.80  
Reading, 60 %  
Westworth's Rubber Jaw, Nos. 1, 2 and 3, 50 %  
**Wood Workers**—  
Massey Vise Co.:  
Lightning Grip, 15 %; Perfect, 15 %  
Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.  
**Miscellaneous**—  
Holland's Combination Pipe, 60 @ 60 1/2 %  
Massey's Quick Action Pipe, 40 %  
Parker's Combination Pipe:  
87 Series, 60 %; 187 Series, 60 1/2 %; No. 870, 40 %  
**Wads—Price per M.**  
B. E., 11 up, 60¢  
B. E., 9 and 10, 70¢  
B. E., 8, 80¢  
B. E., 7, 80¢  
P. E., 11 up, \$1.00  
P. E., 9 and 10, 1.25  
P. E., 8, 1.50  
P. E., 7, 1.50  
Ely's B. E., 11 and larger, \$1.70 @ 1.75  
Ely's P. E., 12 to 20, \$3.00 @ 3.25  
**Ware, Hollow**—  
Cast Iron, Hollow—  
Store Hollow Ware:  
Enameled, 45 @ 10 %  
Ground, 50 @ 5 %  
Plain or Unground, 60 %  
Country Hollow Ware, per 100 lbs., \$2.75  
White Enameled Ware:  
Maslin Kettles, 65 @ 10 %  
Covered Wares:  
Tinned and Turned, 35 @ 10 %  
Enameled, 45 @ 10 %  
See also Pots, Gluc.  
**Enameled**—  
Agate Nickel Steel Ware, 60 %  
Iron Clad Ware, 70 @ 10 %  
Lava, Enameled, 40 @ 10 %  
Never Break Enameled, 50 %  
**Tea Kettles**—  
Galvanized Tea Kettles:  
1/2 in., 6 7 8 9  
Each, 45¢ 50¢ 55¢ 65¢  
**Steel Hollow Ware**—  
Avery Spiders and Griddles, 65 @ 65 1/2 %  
Avery Kettles, 60 %  
Perforated, 50 @ 50 1/2 %  
Never Break Spiders and Griddles, 50 %  
Never Break Kettles, 60 %  
Solid Steel Spiders and Griddles, 65 @ 65 1/2 %  
Solid Steel Kettles, 60 %  
**Warmers, Foot**—  
Pike Mfg. Co., Soapstone, 40 @ 40 1/2 %  
**Washboards**—  
Solid Zinc:  
Crescent, family size, bent frame, \$3.70  
Red Star, family size, stationary protector, \$3.70  
Double Zinc Surface:  
Saginaw Globe, family size, stationary protector, \$2.25  
Cable Cross, family size, stationary protector, \$3.40  
Single Zinc Surface:  
Nalad, family size, open back, perforated, \$2.90  
Single Saginaw Globe, \$2.75  
Brass Surface:  
Brass King, Single Surface, open back, \$3.65  
Nickel Plate Surface:  
No. 1001 Nickel Plate, Single Surface, \$3.65  
Glass Surface:  
Glass King, Single Surface, open back, \$3.65  
Enamel Surface:  
Enamel King, Single Surface, vented back, \$3.65  
**Washers—Leather, Axle**—  
Solid, 50 @ 10 @ 30 @ 10 @ 10 %  
Patent, 90 @ 90 1/2 %  
Coll: 1/4 1 1 1/4 1 1/2 per box  
**Iron or Steel**—  
Size ball, 5-16 3/4 1/4 1/4 3/4  
Washers, \$5.00 4.70 3.40 3.20 3.00  
The above prices are based on \$5.00 off list.

In lots less than one keg add 1/4¢ per lb.; 5-lb. boxes add 1/4¢ to list.  
**Cast Washers**—  
Over 1/2 inch, barrel lots, per lb., 1 1/4 @ 1 1/2  
**Weather Strip**—  
Flexible Felt—  
Lined, per 100 ft., \$2; \$3; \$4, 40 @ 10 %  
Moore's Unlined, per 100 ft., \$2; \$3; \$4, 50 @ 10 %  
**Wedges**—  
Oil Finish, 1 lb. 2.70 @ 2.80¢  
**Weights—Hitching**—  
Covert Mfg. Co., 30 @ 2 %  
**Sash**—  
Per ton, f.o.b. factory:  
Eastern District, \$27.50 @ \$28.50  
Southern Territory, \$23.00 @ \$24.00  
Western and Central Districts, \$24.00 @ \$27.00  
**Wheels, Well**—  
8-in., \$1.55; 10-in., \$2.00; 12-in., \$2.50; 14-in., \$4.00.  
**Wire and Wire Goods**—  
Bright and Annealed:  
6 to 9, 80 %  
10 to 18, 80 @ 2 1/2 %  
19 to 26, 80 @ 7 1/2 %  
27 to 36, 80 @ 2 1/2 %  
Galvanized:  
6 to 9, 75 @ 5 %  
10 to 14, 75 @ 7 1/2 %  
15 to 18, 72 1/2 @ 10 @ 2 1/2 %  
19 to 26, 72 1/2 @ 10 @ 2 1/2 %  
27 to 36, 72 1/2 %  
Coppered:  
6 to 9, 75 @ 5 %  
10 to 14, 75 @ 7 1/2 %  
15 to 18, 72 1/2 @ 10 @ 2 1/2 %  
19 to 26, 75 @ 10 @ 2 1/2 %  
27 to 36, 75 %  
Tinned:  
6 to 14, 75 @ 10 @ 2 1/2 %  
15 to 18, 75 @ 7 1/2 %  
Brass, Net list.  
Copper, Net list.  
Cast Steel Wire, 50 %  
**Spooled Wire**—  
Annealed and Tinned, 70 @ 10 @ 75 @ 10 %  
Brass and Copper, 60 @ 10 @ 65 @ 10 %  
Retailers' Assortments, per box, \$2.25 @ \$2.50  
Wire Clothes Line, see Lines.  
Wire Picture Cord, see Cord.  
**Bright Wire Goods**—  
List June 24, '03, 90 @ 90 1/2 %  
Brass Cup Hooks and Brass Screw Hooks, 65 @ 1 %  
**Wire Cloth and Netting**—  
Galvanized Wire Netting, 80 @ 5 @ 80 @ 10 %  
Painted Screen Cloth, 100 ft., \$1.25  
Standard Gate, Hardware Grade:  
Nos. 2, 2 1/2 and 3 Mesh, sq. ft. 3¢  
Nos. 4 and 5 Mesh, sq. ft. 3 1/2 ¢  
No. 6 Mesh, sq. ft. 3 1/2 ¢  
No. 8 Mesh, sq. ft. 4 ¢  
**Wire, Barb**—See Trade Report  
**Wrenches**—  
Agricultural, 80 @ 80 1/2 %  
Alligator or Crocodile, 70 @ 10 @ 75 %  
Baster Pattern 8 Wrenches, 70 @ 5 @ 70 @ 10 %  
Drop Forged S., 45 @ 45 1/2 %  
Acme, 60 @ 10 %  
Alligator Pattern, 70 %; Bull Dog, 70 %  
Bemis & Call's:  
Adjustable S, 40 %; Adjustable S Pipe, 40 %; Briggs Pattern, 40 %; Combination Bright, 40 %  
Steel Handle Nut, 40 @ 5 %  
Combination Black, 40 @ 5 %  
Merrick Pattern, 50 %  
Boardman's:  
Coes' Genuine Knife Hdl., 40 @ 10 @ 5 @ 5 %  
Coes' Genuine Steel Hdl., 40 @ 10 @ 5 @ 5 %  
Coes' Genuine Key Model, 40 @ 10 @ 5 @ 5 %  
Coes' Genuine Hammer Handle, 40 @ 10 @ 5 @ 5 %  
Coes' "Mechanics", 40 @ 10 @ 10 @ 5 @ 5 %  
Donohue's Engineer, 40 @ 10 %  
Eagle, 40 @ 10 %  
Elgin Wrenches, 10 doz., \$2.25  
Elgin Rethreading Attachment, only with one die, 10 doz., \$6.25  
Elgin Extra Dies, 10 doz., \$7.00  
Elgin Extra Jaws, 10 doz., \$1.75  
Elgin Monkey Wrench Pipe Jaws, 10 doz., \$2.10  
Gem Pocket, 20 %  
Hercules, 20 %  
W. & B. Machinist:  
Case lots, 50 @ 5 %  
Less than case lots, 50 %  
W. & B. Railroad Special:  
Case lots, 50 %  
Less than case lots, 40 @ 10 @ 5 %  
Solid Handies, P. S. & W., 50 @ 5 %  
Vulcan, 50 %  
Vulcan Chain, 50 %  
**Fruit Jar**—  
Triumph Fruit Jar Wrench, 5 gross lots, \$7.50; 10 doz., \$3.00  
**Wrought Goods**—  
Stables, Hooks, &c., list March 17, '92, 90 @ 90 1/2 %  
**Yokes, Ox, and Ox Bows**—  
Fort Madison's Farmers' & Freight, list net  
**Zinc**—  
Sheet, per 100 lb., \$8.50 @ \$8.75





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